Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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A Spirit of Confidence Manifested at the Convention

LIKE a man rising from the ground after having been beaten down, battered and bruised by some combination of forces which he was powerless to resist, but surprisedly discovering himself whole, with no bones broken and with a tingle of internal energy which tells him that he still has power to conquer any mortal enemy, so the electric railway industry seems to feel its intrinsic soundness and strength necessary to meet today's problems even after the past six years of strife. This, if we have correctly sensed the feeling of the railway men, characterized the spirit of the annual convention of the association this week. The meetings were replete with discussion, all of which gave the impression that the speakers were more confident of ability to cope with the future, that a grasp is already had of many of the vexing situations which have caused so much discussion of late years, and that there is increasing stability in the industry as a whole. This does not minimize, nor indicate any forgetfulness of, the serious present-day problems yet to be solved. Rather it was the manner in which these problems were attacked, the assurance with which they were analyzed and examined, that gave the impression that the industry is more certain of itself than a year ago. Not only in the meetings but in the halls, on the Boardwalk, in all small groups and pairs of friends and acquaintances, one heard and felt optimism and assurance. There were no "rotten business" conversations, but constructive, "the-corner-is-turned," positive discussions of the situation.

With the foregoing as a somewhat figurative background or interpretation of the convention as a whole it is worth while pointing out some of the prominent features and accomplishments. Noticeable on account of their absence, and on account of the reduced attendance directly attributable thereto, were the exhibits of previous years. But there were many remarks that, while the exhibits were of interest and value, their absence this year, when constructive study in the sessions was so desirable, was probably conducive to the best results. At that, an attendance of more than twelve hundred, all present for serious business, was a worthwhile and commendable record.

Salesmanship, recognized as the principal element in the railway business; clean-cut financial reconstruction, and better business methods in general in the railway industry formed the keynote strain of the convention. It permeated most addresses and discussions, no matter on what nominal topic they started.

The group of addresses on finance presented at the Wednesday morning session of the American Association represents one of the really great and constructive pieces of work of the association. While not minimizing in the slightest any other effort at the convention, the address of F. E. Frothingham alone would have made the meeting an outstanding one for its value. This address is presented in full in this report number. It is a sample of the sort of financial leadership the ELECTRIC RAILWAY JOURNAL has called for from time to time; it is in full support of the sort of financial program which President Gadsden has so continuously recommended during his presidency of the association.

Another accomplishment was a clarifying, if not a definition, of the attitude of the industry as to the bus. This is referred to elsewhere in these columns. The strongly supported meeting of publicity men, attended by many leading executives, tended to emphasize the importance of this work and to put it on a higher plane. And finally, though it was one of the first things done, the changes in the constitution which, if carried out in spirit, will mean so much to the association were adopted after full discussion and with the evident wholehearted desire on the part of every one to make the association more useful, more constructive, more virile in its activities.

No one can have attended this year's convention without being encouraged, without having gained an appreciation of the value of the association and its conventions and without having gained confidence in the eventual, if not early, return to complete vitality of the electric railway industry.

The New Administration of the American Association

ROBERT I. TODD, Indianapolis, takes up the reins of the American Electric Railway Association for the ensuing year. A modest, lovable, capable, experienced man, combining in one individual the dual association interests of urban and interurban transportation, he is an executive in whose hands the affairs of this great industry may well be intrusted. His forte is in quietly, carefully planning and executing the tasks confronted. It may therefore be expected that the work done by the association during the next year will be great, though there may be less evidence of it in public expression.

With the president, two of the vice-presidents and six of the twelve members of the executive committee elected at large located in the West, there can be no justification for the assertion this year that the association is run in the East. This is the opportunity for the West to make the association an instrumentality of greater usefulness to the great properties of this section and to shape its activities to reflect more completely the wishes of the entire industry, if there has been any provinciality in its functioning heretofore. It is up to the West, and particularly the Middle West, to make good its administrative opportunity.

Taken as a whole, the new executive committee is an exceptionally strong one and it would be hard to suggest wherein the nominating committee could have improved on its selections. It reflects the careful canvas of the field made and the value of appointing the nominating committee in advance of the convention as provided in the revised constitution.

No Bus Members for the Association

AFTER an extended but very satisfactory discussion of both sides of the proposal to revise the constitution so as to leave it to the discretion of the executive committee to admit bus companies to membership in the American Electric Railway Association the amendment was rejected by a decisive vote. The issue of the discussion was whether well-established, non-competitive bus companies should be taken in so that the association might benefit by their knowledge and experience or whether they should be kept out to avoid any possible distortion of publicity to indicate that the association had recognized or acknowledged that the electric railway was passing and was to be replaced by the automotive vehicle. There was plenty of feeling that to pass the amendment would seriously embarrass some companies in their local situation, and of course such a possibility, seeming real, was to be avoided. The basis for this feeling was the possibility that to recognize the non-competitive, responsible, well-managed bus company would be broadly interpreted in the public mind, perhaps aided by insidious propaganda, to include the irresponsible, unregulated jitney which in many places is seriously jeopardizing the investment in the electric railway and forming obviously unfair competition.

In refusing to admit bus members, however, it should be noted that this action was not in any sense a decision to refuse to recognize the bus as a type of vehicle that may be used profitably and properly by the present members of the association in providing transportation in certain locations or sections of a community, co-ordinating it with the present rail system. In fact, continued and more intensive study of the possibilities of utilizing the motor bus and trolley bus were urged even by those who were most insistent that bus companies should not be admitted to membership. The judgment was clearly that the electric railway companies should openmindedly consider where they can advantageously employ buses, and not that they should take the attitude that the bus as a tool of transportation is one to be scoffed at or ignored. Many of those who spoke on the subject stated concretely that they were now planning to introduce, or had already introduced, the bus for supplementary and complementary service to their present systems. If any vehicle of mass transportation offers a means of more economical service in any location, certainly the present transportation companies should welcome its advent and capitalize its advantages.

Engineers Again Boost Plan for American Committee on Electrification

AMONG the many items of vital interest which marked the second session of the Engineering Association convention none was more significant than the decision to start something in the direction of unity of action in heavy traction investigations. It will not appear invidious if special attention is directed to this matter, because duplication of work in this field on the part of several national associations is already becoming a serious matter. It is none too soon to plan for such co-operation as will insure accurate and complete data in regard to electrification.

The Engineering Association suggests the name "American Committee on Electrification" as an appropriate one for a joint committee representing all interests affected by the electrification of railroads. It is proposed that a joint committee, with this name or some other, be charged for the present simply with the responsibility of collecting and disseminating information with the least possible lost motion. That seems like a very simple proposition. There ought to be no opposition to it. The main trouble is to make a start.

It has been said that "the way to resume is to resume." So the way to have an "American Committee on Electrification" is to appoint an American committee on electrification and to tell it to do something. It does not matter which association starts this movement, just so that one of them does so. It is to be hoped that the executive committee of the Engineering Association will act favorably upon the resolution adopted at the convention, and invite the appropriate executive bodies in other national societies to appoint representatives on a joint committee.

The only possible objection to this plan is that it would add one more to the already many joint committees trying to facilitate progress in this or that direction. This objection is a valid one, but the subject of electrifying the steam railroads of the country is one of such moment and importance that the societies are certainly justified in adding this one to their multifarious activities. The fact is, they are already doing a lot of work along this line, and the purpose of the proposed committee is to reduce, rather than increase, the total amount of work by cutting out lost motion.

Salesmanship Beginning to Be Taken Seriously

ONE of the best products of the 1921 convention was the profound impression made as to the necessity for injecting salesmanship into the conduct of the electric railway business. President Gadsden took the delegates seriously to task for their neglect to take to heart the earnest suggestions made along this line heretofore. He attributed the present straits of the industry to its absolute disregard of the laws of economics and selling applied in every other commercial enterprise the world over. His address and the one by Mr. Goodwin made it pretty clear that for the present at least the problem of salesmanship transcends all others. Both were confident that proper attention to the commercialization of the business will transform the financial condition of the industry, and that failure to do so, particularly in view of the menacing competitive situation, will lead to the financial ruin of the enterprise as a private one.

While several expressions were heard on how to go about securing the proper application of salesmanship all through the business, there was found to be a common belief that the railway president with real sales instinct as one of his characteristics is the ideal man to direct the selling of the company's product. Where a railway is large enough, the officer who is directly in charge of the operating department may well be the man primarily intrusted with merchandising the service. This and the further development of the sales organization of an electric railway are well shown in the chart included in the article by Mr. Goodwin which appeared in the convention issue of the ELECTRIC RAILWAY JOURNAL, Sept. 24, 1921, page 472.

There is no doubt that the sales work must start at the top, including some sales attitude in the directorate as well as the chief executive. The president must infuse the whole organization with the spirit of selling

transportation to the public. But he cannot enthuse his staff unless he himself is full of the spirit of salesmanship. For example, if courtesy is an essential of salesmanship, then courtesy must originate with the chief executive. It must permeate down through the organization and reach the car riders from their contact with the platform men. One good point touched on in the discussion of this subject was the recommendation that employees should be kept informed on the many problems confronting the company. They cannot explain to the public unless they are posted. They must understand the goods they have for sale. Mr. Goodwin stated that transportation ought to be the best advertised product in the world because it has hundreds of thousands of potential salesmen coming into daily contact with millions of customers. So it should, and through proper co-ordination the conductor and motorman will so carry out orders as to make more and more friends for the company and thus "put over" the service rendered in a way that should lead not only to good will but to prosperity.

Organization Changes Are Now in Effect

NOW that the proposed changes or revisions of the constitution and by-laws have become a fact, as modified and adopted by the convention, it is well to examine their purpose and probable effect upon the future activity and usefulness of the association.

Most important is the provision for active management of the association's affairs by the executive committee in monthly meetings. This provision, it should be noted, was understood and accepted by those who have consented to serve as officers during the next year, so that the provision will probably be carried out in the full spirit of its intention. This augurs well. It should result in a much higher standard of association activity than when all the responsibility must be shouldered by a secretary necessarily held close to the office, working under the advice of an overloaded president. The provision for the various standing committees is of course important and is a part of the better management machinery which the association has set up. Of course, the most important factor in the operation of the association is the men in charge of its affairs, yet the machinery provided should be made most fitting to assist them in their work.

But there were some matters of association policy originally proposed most of which fell by the wayside at this time, though it was recognized that at some future time action might be different in some cases. Thus, the proposal to change the terms of office of the vice-presidents was not revived, though there had been indication from several individuals that this was considered by them an important point. Transportation companies other than rail will not be admitted to membership, though this had been recommended by the executive committee. The proposal that municipal railways be admitted, made by the reorganization committee but vetoed by the executive committee, was not raised on the floor, and the attitude to be taken toward the individual municipal employee is still undecided. It was apparently the belief of the membership in these various cases that where some of the members thought the adoption of certain new policies might seriously injure them, the association should postpone action until time would develop a more nearly unanimous opinion in favor of the change.

This is undoubtedly for the best. The association will progress most rapidly when all work toward a common purpose with a common policy. At the end of the convention that common purpose and spirit seemed to be strongly in evidence.

Will a New Era Come in New York?

THE proposed reorganization plan of the electric railway systems in New York City offered by the Transit Commission on Sept. 30 is of a constructive nature. The prominent officials in the city administration, which has been hostile to the companies since it assumed office four years ago, claim to see in it an increase in fare to 8 or 10 cents. But this is not justified by any statements in the report, which advisedly declares in favor of a 5-cent fare if that is possible and guarantees that fare for at least a year after the plan goes into effect. It is hoped that before the rate of fare is definitely settled there will be a very careful consideration of the undoubtedly close relation between rates of fare and city planning and development. The principal railway officers have in general refrained from public comment, evidently desiring to know more in detail how the main principles laid down in the report are to be applied concretely.

In fact, the report is an outline only of a proposed plan and its effect on individual companies can be determined only when more information is available as to the way in which it is to be applied. Thus the plan contemplates the taking over of the properties to form the new system on a valuation, but does not explain the basis on which that valuation will be conducted. It also says that railways whose earning power is not sufficient will not be included in the proposed consolidated system. The security holders of those chosen will be awarded 5 per cent bonds up to the value of the property, and a bonus is mentioned as a reward for efficient management, with a barometer fund to determine the rate of fare.

These features show that the plan, broadly speaking, belongs to the service-at-cost class with the addition of an incentive clause, the nature of which is not very clear from the printed report and probably remains to be worked out. The promise is made, however, that those details will be taken up promptly. Hearings are to be conducted and the commission hopes that by next summer the consolidation will be effected and the new system will be functioning.

If the future conclusions of the commission are as wisely reasoned as those in its preliminary report and it has the ability to carry them out promptly the transit situation in New York will be greatly improved.

Every one has realized for a long time that something radical had to be done to bring the present chaotic condition to an end. The surface roads are in a particularly bad condition, especially those with the heavy investment charge of a conduit system. Many are not paying their fixed charges and none can be considered in a prosperous condition. The rapid transit lines are not much better off. The Brooklyn Rapid Transit is in the hands of a receiver, the question of an appointment of one for the Interborough is before the court and the stock of the Manhattan Railway, which under the present lease of that company to the Interborough Rapid Transit pays 7 per cent on par, is selling in the market for about 40.

Such a condition is not good for the companies or for the city. The new plan at least points a way out. It should be developed more fully.

Relation of the Electric Railway Industry to Industrial Efficiency*

By Herbert Hoover
Secretary of Commerce of the United States

Better Understanding of Importance of Electric Railways to the Community and to Industry and Employment Is Necessary in Order to Recover Economic Stability and Develop These Services—Ceaseless Public Education Essential

ONE of the outstanding results of the present unemployment conference has been to impress on every one the unlimited interdependency of our various industries. Not that the general fact was unknown or unexpected, but the conference has brought the fact forward with startling distinctness.

Your industry is no exception to this, but on the contrary is probably one of the most conspicuous examples. It would appear that the only thing which kept you going, as an industry, during some of the past years has been the very necessity of your service in order that the rest of the community could progress and function industrially and socially.

When I speak of "your industry" I mean and visualize the urban and interurban transportation business. For I assume at the outset that, except for the natural desire to protect your reasonable investment in railways as such, you recognize your responsibility to furnish to a community the transportation which is necessary for its development and success irrespective of what physical agency you may deem best to utilize for the purpose.

But, even with the necessity of your service recognized, you are, I understand, in a critical condition, though in a way which differs from the condition of other industries in many respects.

The condition of your industry is indeed critical in many aspects. The whole condition has arisen, at least in part, it seems to me, from a lack of appreciation, both on the part of the general public and on your own part, of the basic interdependence of your industry and the rest of the industries of the community and nation.

Some of the data which bear upon this are astonishing, and are conclusive of the point:

You represent a fixed investment said to be about $6,000,000,000, upon which a great deal of industrial and other business credit is based.

You employ some 300,000 men in normal times.

You burn annually more than 16,000,000 tons of coal.

You have a gross income, estimated for 1920, of some $955,000,000, of which approximately 6 per cent, or nearly $60,000,000, is repaid to the communities in taxes, not to mention the paving maintenance which most of you carry.

You pay out more than $300,000,000 in wages, which is used principally for purchasing commodities and the products of other industries.

You buy directly supply material which costs another $300,000,000.

You buy, in normal times, another $200,000,000 worth for extensions, replacements, etc.

You transport, each year, from 12,000,000,000 to 15,000,000,000 passengers—twelve times as many as the steam railroads.

The very marshaling of these data indicates the close relation your industry has to other industries and its importance to the nation.

There is another element to your service, too, which must not be overlooked, and that is the housing situation—the adequate planning of community life. As you who have developed the industry realize, the only factor which makes possible a healthy expansion of housing facilities beyond the confines of congested city districts is adequate transportation.

I mention all these facts, most of them of every-day knowledge to you, for the purpose of emphasizing the close interdependence of your industry and the industrial life of the community.

The public, on its part, not only must recognize your service in relation to other industries and businesses, but must recognize you as an industry and a business subject to the impact of economic laws that dominate the other industries and businesses.

To be sure, the classification of your business as a public utility has

HERBERT HOOVER, SECRETARY OF COMMERCE

Thoroughly immersed in the unemployment conference and daily wearied by an endless chain of interviews on this subject, Mr. Hoover turns aside for a while to devote his attention to the electric railway industry, realizing its important function in the general industrial life of the community. *Copyright, Underwood & Underwood.*

*Address delivered at the annual convention of the American Electric Railway Association, Atlantic City, N. J., Oct. 3-6, 1921.

entailed regulation of rates designed to take the place of competition which is in the main theoretically absent, and intelligent regulation realizes the necessity of proper return on actual capital invested if these services are to be extended and satisfactorily maintained.

There can be no question but that in the face of rising prices and wages, with at the same time a regulated income, both industry and service have suffered greatly during the past six years; falling prices and wages will of course improve this situation.

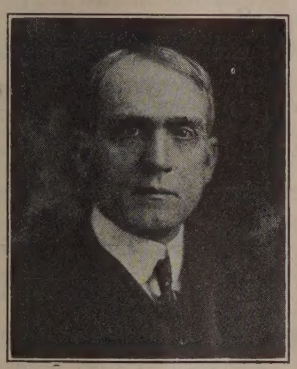
Beyond this, however, a better understanding is needed of the interrelation of these factors and of your importance to the community and to industry and employment as a whole if we are to recover economic stability and if these services are to develop.

I know of only one way to a full understanding of these matters—ceaseless public education on the elemental facts.

Put Business Common Sense Into Electric Railway Managing*

Thirty-three Years of Economic Errors Emphasize the Need of Instilling the Industry with the Commercial and Financial Instinct—Know the Unit Cost of Your Service—It Is Essential in Making Salesmen of Your Employees

By Philip H. Gadsden
President American Electric Railway Association



PHILIP H. GADSDEN

IN THE backwash of the great war through which we are now all passing we are conscious, if we think at all, of the movement of a great economic current whose meaning we do not as yet understand and the extent of whose operations we cannot grasp. We know, however, that every business enterprise recognizes the change in economic conditions and every business concern is giving its best thought and attention to changing and modifying the methods of conducting its business in order to adjust itself to these changed economic conditions.

So it is with us. We have been engaged ever since the war in an intensive study of the electric railway situation in this country, in the effort to adjust and modify our methods of transportation in accordance with the lessons drawn from that great struggle.

As I look back on the very short history of the electric railways in this country it seems to me that our whole pathway of thirty-three years has been strewn with economic and business errors. This industry of ours inherited bodily all of the traditions of the horse car. In those early days the entire thought and attention of the pioneers of electric railways in this country were concentrated on the development of the engineering and mechanical problems involved. We were so intent upon developing the electric traction that we entirely overlooked the commercial and the financial problems underlying our great industry.

What was the result? Without thought, without consideration, we took over the 5-cent fare without a question, simply because it had been the habit for people to travel on a horse car an average of not over 2 miles for a nickel.

What else could we do? Because the horse cars for that nickel carried people as far as their rails extended, a distance which rarely exceeded 2 or 3 miles, we also agreed to carry our patrons on the same basis for the same nickel, absolutely in violation of all business principles. As I look over the history of business in the world I can recall no other phase of human activity, no one else who had the monumental courage to attempt to conduct an industry like this in defiance of all laws of economics. Is it any wonder we find ourselves where we are?

RAILWAYS A BUSINESS FAILURE

What have we done? In the short space of thirty-three years we have built up a transportation industry which has 44,000 miles of track. It employs over 300,000 people and operates about 80,000 cars, which annually transport many times more passengers than all the steam railroads in this country combined. It is a wonderful achievement, but it is purely from an engineering and a scientific standpoint. From a business standpoint, tested by the rules of common sense and business, we have been a monumental failure.

Now that the haze of the conflict has gone and we are beginning to see the meaning of the struggle we have been through, what lessons shall be drawn? That the future problems of this industry are not engineering, are not scientific, but that the future salvation of the electric railways is in the hands of the commercial men of the industry.

In every business except our own there are two distinct branches. The first is the manufacturing, or production end; the second the commercial, or the sales end. Is there any such division of labor in the electric railways? You will find this commercial development in the steam railroads, in the gas business, in the textile mills and automobile factories. You find it developed in the highest possible character in the electric light and power business. In every line of human activity except ours this well-regulated attention to the commercial and economic ends of the business has been recognized as fundamental. Are we supermen? Can we succeed in defiance to all the laws of political economy? We see the answer in our trial balances tonight.

"TYRANNY OF THE BALANCE SHEET"

As I said on a previous occasion, the hard lesson which we have had to learn and the hard lesson which the public must be taught is that electric railways in this country, while their rates may be regulated by commissions, where other businesses are free to charge what they wish, while its service is dictated to it by a commission, when the service of every other business is governed by economic conditions, while we are hampered on every hand, we still enjoy in common with every other business in the world one privilege, and that is that we live under the tyranny of the balance sheet.

But from now on what I want to impress upon this industry is that the test of a successfully operated property is the same test which is applied to any other business; that is, have you a red or a black figure at the bottom of your balance sheet?

That means that in the future we must put less emphasis on our engineering problems and more and more emphasis on the commercial and financial problems.

What are the problems which are crowding upon us for solution? One is the unbridled and unregulated jitney bus competition, which is eating out our very vitals, while we are chained to the rock of commission regulation. That is a commercial problem which

*Abstract of address presented at the banquet of the annual convention of the American Electric Railway Association, Atlantic City, N. J., Oct. 3-6, 1921.

must be met as any other business would which is affected by lawless and unregulated competition.

TAX-EXEMPT SECURITIES

We are faced at Washington with a great problem of taxation. The question of how it is going to be possible for the electric railways in the future to acquire sufficient new capital to provide for the betterments and improvements imperatively demanded by the various communities, of when and how can that capital be secured in competition with tax-exempt securities which are being issued by the millions by our city and state governments, is a problem which will require very grave study. Unless some remedy can be found for that situation of affairs there is no hope of financing this great industry for any extended period. It is up to you to sell to the Congress of the United States the idea that the electric railway is one of the essentials of human life, that here is an industry which lies at the very base of industrial life and is being throttled to death by unwise and impolitic fiscal policy on the part of our government.

In saying these things and in calling them to your attention, if you were the salesmen I wish you were you would go home and do something about it, but you don't. This question of taxing the securities has been fully ventilated and advertised in *Aera* and in ELECTRIC RAILWAY JOURNAL, by facts put there at my request in the hope that each one of you would take it up and sell the idea to your Representative and your Senator. Have you done it? I can answer for you—you have not! If you had been a salesman, if you had had the commercial instinct I am talking to you about, you would have done it. Why didn't you do it? Because you have been trained that service is the one thing to keep your mind on.

We have carried this idea of service to the *n*th degree. I am not at all minimizing the value of good service. I realize that none of these things can be brought about unless we do give good service, but what the electric railway industry is trying to do is to give service even if it cannot afford to give it. Does anybody else do it? No! We have got to change our viewpoint. How will you do it? We here cannot bring it about alone. This is a question of mental attitude, a question of viewpoint, and you must get this idea down through your entire organization and personnel.

ESTABLISH HUMAN RELATIONSHIP

We must as an industry, from the president to the platform man, realize from now on that we are like everybody else. We are not like the Jew in the temple who thanked God he was not like other men. We have been doing that for thirty-three years, thanking God that we did not have to conduct our business like any other business and that we were exempt from the laws of political economy. Now we want to imitate the other fellow who bowed his head in shame and asked that Providence be merciful to him a sinner. We are sinners. We have sinned against the laws of business common sense.

How are you going to get the motorman, conductor and your subordinates into this scheme? We have got to go back to the human relationship which we lost when the industry passed out of the horse-car days. We got so big and employed so many people that the presidents and general managers no longer knew the men on the platforms. We turned that over to somebody else and in that we missed our mark. This job of establishing personal relationship is not to be handed out to a car starter. It's a president's job. It is up to him to enthuse his organization with his own spirit.

One of the prime essentials of salesmanship is that the salesman shall know the value of the goods he is selling. The salesman knows the cost price of his goods, and therefore he is in a position to discuss intelligently with the customer whether the price he is asking is reasonable.

KNOW THE VALUE OF YOUR GOODS

How many men in our organization from the president down know today the value of the goods he sells? We must first have a value placed on our properties, one that the public recognizes and admits. If your motorman, conductor, cashier, collector and every other man in your organization is equipped with this information he has, at least, one of the essentials of salesmanship. He is in a position to say, "The service we are giving to you costs us so many millions of dollars."

A NEW ATTITUDE NECESSARY

I hope I have gone far enough to impress upon your minds what is perfectly clear to mine, namely, that the way out of the difficulties and trials and tribulations which surround us is to have an entire change of heart. We have the habit of laying all of our troubles upon the public. Most of our troubles, most of the abuses which are heaped upon us have been brought on by ourselves. We have invited them; it is our fault that we have a fixed 5-cent fare, not the fault of the public. It is our fault that we carry our riders 20, 30 or 40 miles for a nickel, not the fault of the public. If we tell the public that and admit that we made a mistake, we will have a better chance to preach this new gospel and this new evangel I am talking to you about, for the salvation of this industry depends upon the exercise of the principles of salesmanship.

The Future of Street Railway Financing*

Railways Are a Necessity and Means for Their Financing Should Be Provided—Proper Financial Organization for Service-at-Cost Franchises Is Outlined

By J. K. Newman
Isidore Newman & Sons, Bankers, New Orleans

THERE was a time when municipal ownership was advocated as a solution of the street railway problems, but the cities seem not to want the properties now. Furthermore, the bondholders don't want to foreclose and the equity holders are left with the burden. It is impossible at this time for any street railway to sell even first mortgage bonds, though the issue may be small and better protected than the best standards required in the past. There is no industry which has been hurt more and "hollered" less. The time has come to "holler" loud and continue to "holler" until the truth is known and then to "holler" some more lest the people forget. We have kept our troubles too much to ourselves and the effort to explain the facts has been spasmodic and not continuous.

An organization should be formed and supported by all street railways of the United States to give publicity to the facts. This organization should be organized as a corporation with a complete staff capable of telling the whole story to the public and persistently telling it by every means which seems effective, dignified and businesslike. The trackless trolley car has been shown in moving pictures throughout the country and the effect on the public mind is astonishing in the hope which it has instilled for a cheaper and better transportation. This fallacy must not go unchallenged. The street railway interest should counteract it by the best moving picture story which can be written to show the street railway side, and the picture should be made beautiful to the eye and illuminating to the brain. This is only a trivial suggestion compared to the many substantial things which can be done to counteract the demagogue, the dishonest politician and to educate the men who would really like to know, and, knowing, would be fair.

Municipal ownership would be a blessing to the owners of street railway securities; it may prove far less satisfactory to the public. But the cities won't buy. To their credit it must be said that there are many state commissions and many city authorities who are trying to do the square thing.

*Abstract of paper presented at annual meeting of American Electric Railway Association, Atlantic City, N. J., Oct. 3-6, 1921.

Unfortunately, however, there are still some city or state authorities who have not the courage to advocate municipal ownership or to give relief by granting higher fares. They falsely fear it means political doom. This is notably and disgracefully true of New York City. But the street railway system is necessary for the life of the city. Hence the city should take over the property at a fair valuation and attempt to operate it in the interest of the people, or allow the owners to do so.

SERVICE-AT-COST FRANCHISES

If the city does not want municipal ownership, it must provide a rate of fare which will yield a fair return on a fair valuation. Many cities have recognized this policy and are adjusting the street railway problem fairly and squarely, but there are some holdouts. Again, argument is used that the street railways will become obsolete. This is an absurdity, not carefully analyzed, but used for the purpose of oppression, and unfortunately it has reached the banker and the investor. If the cities will not buy the street railway systems then service at cost must be granted to the companies. Without some incentive it is contrary to human nature for the management to exhaust its brains and energy on such a proposition. This incentive should be in several forms, as follows: (a) A premium on new capital raised either for extensions or betterments, if it means economy or improved service; (b) a higher return on a fixed valuation when there is a diminishing cost for the service rendered; (c) the right to earn an excess over the fixed return to create a stabilization fund to insure the fixed return continuously. The company should be permitted to invest such excess in property account, but no return should be allowed upon property acquired from such excess. This excess should be large enough to provide for junior financing as hereinafter referred to. (d) The city should recognize the value of expert advice in all branches of its service and permit the cost thereof to be charged as an operating expense. It is often true that a dollar paid for expert advice returns itself many times either in savings or in mistakes avoided. (e) Every effort should be made to reduce the taxes, and the franchise tax should be eliminated altogether.

With a service-at-cost plan in force, the companies must have a financial setup on a modern, comprehensive plan irrespective of what securities may be previously outstanding. Where the companies cannot comply with a standard or modern form of financing, they should find a way out even if they must resort to receivership to readjust the capitalization.

If properties under the service-at-cost plan are to be allowed only an 8 per cent return, the requirement that net earnings after deducting renewal and replacement charges shall show twice the interest on bonds outstanding would limit the outstanding bonds to 50 per cent of the value of the property, assuming that the bonds had to be sold on an 8 per cent basis. That, however, would leave too large a proportion of the cost of additions to be financed by junior securities. Therefore with the modern treatment of renewals and replacements, the bankers must recognize the fact that adequate provision for renewals and replacements protects the bondholders to the same extent as a corresponding surplus over bond interest did in the past when such provision was not made for renewals and replacements. The bondholders will be properly safeguarded in this particular if it is required that the net earnings when added to the renewal and replacement reserve set aside out of earnings shall aggregate twice the interest charge. In this case, such renewal and replacement reserve should be inviolably dedicated to renewals and no portion of such reserve should be available for dividends. Assuming such renewal and replacement charges to amount annually to 3 per cent of the recognized fair valuation, this would permit the issuance of 8 per cent bonds to the extent of about 70 per cent of the cost of the additions and still show twice the interest charges in net earnings and provisions for renewals.

SALE OF JUNIOR SECURITIES

With such a requirement from investment bankers, no street railway company should have first mortgage bonds outstanding in excess of 70 per cent of its valuation. The issue also should be unlimited in amount so that additional bonds can be issued from time to time without limiting the total amount ever to be outstanding, but restricted as to the conditions under which additional bonds may be issued. Under such a plan only 70 per cent of the money can be raised on first mortgage bonds, even after a financial reorganization has occurred either through voluntary process or receivership. How is the additional 30 per cent to be raised? It might come through any one or all of the following sources: (a) The company should be allowed to earn an excess over the fixed return to be invested in additional property as hereinbefore explained. (b) The cities must give such support to the companies that preferred stock can be sold to the patrons of the company. The city should lend its effort to insure stability of principal and continuity of dividends on this preferred stock by removing all obstacles in the way of profitable operation. This means the city should indorse one and only one system of transportation, thus enabling a monopoly, if you want to call it by this name, but a monopoly which never grows fat and lives on a mere skeleton diet. (c) When the preferred stock has thus been sold to the patrons of the company and where the first mortgage bonds outstanding are less than 70 per cent of the valuation a second mortgage issue will be safe and will appeal to certain classes of investors who need a larger return than is obtainable on absolutely first mortgage bonds. (d) Sale of common stock. Where the income return allowed by the regulatory bodies is sufficient to cover the average interest rate at which all the company's securities are sold, it will ordinarily be the case that the interest paid upon the first mortgage bonds or other prior lien securities is materially less than the average rate of return. Thus, the surplus net earnings available for the common stock will be materially in excess of the average rate. This should make it possible to sell common stock at par or better to such investors as are willing, in consideration of such increased income, to assume the larger risks of business going with the junior securities.

When the city authorities or state commissions have fixed a fair value on the property and have determined what is a fair return thereon, it is no longer their affair how the company capitalizes so long as the capitalization is such that additional securities can be sold to meet the cost of improvements and additions in the future. For instance, if a company had a valuation of $1,000,000 and was allowed an 8 per cent return thereon and if it could sell at par 6 per cent first mortgage bonds for 50 per cent of the cost of the property, the remaining 50 per cent would be capitalized in the form of common stock and the surplus available therefor would be 10 per cent. The higher yield on the common stock might make junior financing possible, and no interference should be offered by the city if the common stock should show 10 or even 12 per cent return, provided the total return on all securities did not exceed the fair return allowed on the agreed valuation. If the city and state authorities will learn this lesson it will be an important step forward in the financing of junior equities, and thus make street railway financing more feasible.

FRANCHISES AND INDETERMINATE PERMITS

There is nothing more destructive to street railway financing than short term franchises unless it is short term franchises which undertake to make rules, regulations and general conditions of operation in the distant future. Bankers will not recommend and investors will not buy bonds where the maturity thereof is beyond the maturity of the franchise. It is expensive to refund an issue of bonds, and no one advocates that street railway bonds should or could be paid at maturity without refunding. It makes a tremendous difference whether an issue runs for one hundred years or if it is refunded ten times during that period.

If first mortgage bonds on street railways were limited to a fair per cent of the fair value of the property and were properly protected by maintenance, renewal and replacement clauses

and the many other good clauses which the usual mortgage now contains there would be no need for a maturity under one hundred years or more and no sinking fund would be required. However, there are many objectionable conditions which have crept into these mortgages and they must be eliminated, while on the other hand several new clauses should be inserted through which the conditions can be changed to meet conditions which will arise in the future. It would probably be hard at the beginning to have a condition in the mortgages that 50 per cent of the holders of the bonds issued could change practically any or all of the conditions of the mortgage, but if the street railway companies and the bankers will confer from time to time a broader understanding of proper financing will result and mortgages will be devised which will strengthen the companies instead of restricting them to the point where reorganizations are necessary.

The indeterminate franchise is necessary for proper rehabilitation of street railway financing. Such a permit should be exclusive; it should allow the fare to be flexible; it should insure against jitneys and buses which parallel; it should permit ample regulation, but regulation which will not confiscate. A co-operative effort should be made to get all states to adopt a fairly uniform indeterminate permit law. Progress has already been made in this direction, but strenuous efforts are necessary to make this theory a universal practice.

The Basis of Financial Recuperation*

Recognition of Fair Valuation as a Basis of Capitalization by the Railways and Recognition of Fair Rate of Return by the Public Are Necessary—A Simple Financial Structure, with Holding Companies the Exception, Is Also Good Policy

By Francis E. Frothingham
Vice-President, Coffin & Burr, Inc., Boston, Mass.

OUT of the welter of discussion over the difficulties of our street railways, probably the nearest to a common opinion is that the street railway cannot be dispensed with in the larger communities and in their more densely populated tributary territory except by a dislocation of community habits and values not to be contemplated. Confidence that the industry is a permanent one will sooner or later beget success in restablishing it on a sound footing—but only, I am afraid, at the expense of much heart-burning and many losses.

In what I have to say I will not undertake to discuss any of the physical problems, interesting as they are, but will touch only on some of the more conspicuous general ones as they present themselves to the lender of money.

In the first place, it seems to me that the street railway business has not yet emerged from the cloud of public condemnation of past practices, and until this cloud has rolled by no just solution of the difficulties of the industry is possible. It is profitless to rake up the unpleasant past of overcapitalization, mismanagement and political corruption with which the history of the business is unfortunately too replete, unless it serves as a guide in the present. There is no way of allaying this lurking feeling of maltreatment except by persistent candor and patience on the part of the companies. Another handicap to developing local good feeling is, in many instances, the fact of foreign ownership or of distant control by absentee holding companies. The arguments in favor of the holding company are recognized, but I feel confident that in this particular the disadvantages of remote, I had almost said unsympathetic, banker control, in the case of the larger properties at any rate, outweigh the advantages. Absentee landlordism is bad in practice where it can be avoided and a community instinctively resents this sort of dictation in its affairs and not improperly demands a home discussion and solution of local needs. Surely such an interpretation of public hostility gives it a reasonableness that makes it curable.

Good Will Engenders Fair Play

With public sympathly and good will once developed the instinctive human habit of fair play will surely be effective in securing for the struggling companies a fair return on a fair valuation, and more than this they have no right either to ask or expect. That is a very easy thing to say, but as the slang expression has it, "you have said a mouthful." But once this principle is established the problem becomes one of detail, however slow or harassing its solution may be. Cleveland, Dallas, Boston, to name a few conspicuous examples, are making different applications of ways and means to this general principle, and each is securing varying measures of success.

The search for a fair valuation means inevitably the abandonment of many preconceived ideas and a readiness to recognize the fact that existing capitalization is a factor in the search only in so far as it may help to show how much money has actually and legitimately gone into the service of the public. The public demands to know the amount of investment which is reasonably used and useful in its service, and it is increasingly apparent that any effort on the part of the companies to divert the search for that figure will but delay the reconstruction process. It is hopeless and unreasonable to expect support of capitalization which stands only for speculative anticipations, and the sooner the justice of this basic demand of the public is recognized will a great impediment to reconstruction be removed.

Fair Return Must Be Accorded

Search for the fair return on this fair value demands the recognition by the public of the fact that the cost of the commodity which the street railway sells varies as does the cost of any other commodity which it buys and which it expects to fluctuate from time to time. The 5-cent limitation which operators in the past gladly accepted because it seemed then so abundant has prejudiced the companies' case most unfortunately. The public mind should be cultivated to accept a cost of service, as it works out under varying operating conditions, as the fair commodity price, and it surely will when its confidence in the operators is restored and the necessities of its own best interests are fully realized. In other words, where a community is protected from selfish management by commission jurisdiction there need and should be no limitation on the rate of fare required to cover operating expenses, reserves for depreciation and cushion funds, and the agreed upon fair return on the fair valuation. No one can foresee the varying cost of operation, and a fixed limit either high or low in the fares which may be charged is both practically and theoretically a menace to continuity of credit and so to adequate public service, which depends on the existence of such credit. The Boston Elevated now charges a 10-cent fare and the public accepts it as a matter of course, having confidence in the disinterested and intelligent administration of the public board appointed by the Governor under the recent enabling legislation in Massachusetts.

In this connection the war was a ruthless teacher. Suddenly and conspicuously it made all the inherent and slumbering street railway difficulties loom large and destructive—the danger of motor-car competition, the inadequacy of provisions for depreciation, the vital menace of mounting costs of material and labor against a fixed cost of product. The war made the industry totter and left some ruins, but it showed up all the worst that there was to know, so that the salvaging efforts can now be concentrated on that which is worth saving.

The Problem of the Bus

In the jitney and bus service the street railways have been subjected to a very severe type of competition. They have had competition before, but usually in kind. This is a new kind of trackless enemy and the danger was, I think, very unhappily met, perhaps because of a certain tendency of un-

*Address presented at the annual convention of the American Electric Railway Association, Atlantic City, N. J., Oct. 3-6, 1921.

progressiveness in the industry which in the past has made many advances in physical equipment and operating practices wait around, so to speak, for recognition. When the jitney came, the industry unfortunately only decried it as an unfair competitor. The effort was rather to eliminate it on the plea of unfairness than to insist upon its being made a fair competitor. Little or no effort was made to absorb the new agency and to co-ordinate to the public gain the trackless innovation with the tracked system. Thus public opposition was aroused when instead public sympathy and help might have been secured. I am aware that as yet, except on Fifth Avenue, that vertibrate avenue in a long densely populated island, that Arnold Bennett called the finest avenue in the world, there is no demonstrated success in jitney-bus service. Its potentialities are such, however, that it should be co-ordinated with the street railway service and competition, if such there must be, kept at the respectful distance that stimulates but does not kill.

It is even open to discussion whether competition will secure the best rounded and most effective public service. Entire absorption of this new agency by the street railway has much to recommend it, if the companies would agree to put on such service where and when the utility commissions, after hearing, have found a need for it. The public has a clear right to the benefit of advanced practices, and any effort to deprive it of them will only prove a boomerang. Possibly trolley wires may still be used where it is too expensive to maintain the tracks under them, for of course the problem is with the trackless vehicle in general, and not the gasoline-propelled vehicle alone. If there must be competition it is absolutely important and fair that vehicles using the streets for the collection of fares shall equitably bear the costs of street improvement and maintenance. No jitney can permanently expect or should have free use of that portion of a street which a street railway company has built and in winter keeps clear of snow.

FRANCHISES—A QUESTION OF MEN

This brings us to the question of franchises, which have such a direct bearing on the dependability of a fair rate of return. A terminable grant under rigid conditions has no satisfactory basis for financial credit. The indeterminate permit coupled with some form of service at cost, with flexibility of rate adjustment, and the right of a municipality to purchase at an agreed-upon valuation, is the most encouraging type of grant so far developed. The monopoly feature and the equalization of street costs as just discussed are also very important.

Of course the human element in the administration of any type of franchise must always make its effectiveness more or less uncertain, for the administration of any plan can either make or break it, but that does not detract from the necessity for working toward such terms in a public grant as fundamentally seem the fairest and the soundest in principle. Those elements which inject selfish interest and opportunity for manipulation should be eliminated. In the long run it ought to be possible to find good men to do a good job for a fair wage, if their tenure of office is dependent only on the merit of their work. But these considerations only bring us back to the perpetual question of the right men. Just now, for instance, able men of high character are administering the Boston Elevated, under the enabling act referred to, most hopefully. Substitute a board of political henchmen and there will follow disaster under the identical act. So also with the new administration of the old Bay State Street Railway, where remarkable practical results are now being achieved with a very extensive urban and interurban mileage.

Public ownership and operation with its contaminating political influence under our form of government (and experiments in public ownership in Europe are chiefly danger signals) holds no prospect of improvement over private operation and should be turned to only in the event of outright failure of private effort under fair treatment. Should public ownership and operation be resorted to, the only hope of decent service lies in control by a long-time board beyond the reach of political influences. The present management of the Boston Elevated is a compromise plan being watched with much interest. But, as I see it, the burden of private ownership is to make a clear demonstration that it can meet the call upon it, and my personal belief is that it can win out in this effort if it will. But it must be prompt and energetic and ready to take losses in the process.

Recovery of credit also rests on some solution of the labor problem. If company and men can find no way of living together in peace, not by fits and starts, but continuously, money will be hard to find for capital expenditures. Cessation of operations and destruction of property breeds nothing but distrust of the business. The interest of all hands, public, employer and employee, demands a strenuous effort to devise some scheme of compromising differences without either strike or lockout. All three groups should rest their case for final decision and acceptance with some board of arbitration. Possibly the Philadelphia experiments may point a way. Some form of collective bargaining is of course essential, but the basic principle to be recognized is that no group of men in a public service has a moral right either to quit work or to lock out at its arbitrary pleasure, merely because it harbors a grievance, and so tie up a public service.

It is so easy to say these things and so difficult to find a way through that one feels almost ashamed to make what must sound like futilely trite remarks to you who are laboring so hard in the field, while I among others seemingly only look on and say, bring us this thing on a silver platter and then we will help. But it is really not as bad as that on the banker's side. The banker does not buy to hold, he buys to sell, and he can only resell what his customers will buy. He must pass his purchase along, and he cannot do that to people who see street railways shut down over a franchise fight, or because of jitney competition, or of a strike or lockout, or who do not find net earnings coming through for return on their money.

The investor in street railways has been brought up to believe that it was a cash business payable in advance, that it needed little working capital, that the riding habit steadily increased, that he could see all the property and judge for himself if it was well maintained. So he bought and got hurt—and now wants the reasons why corrected before he lends again. All we can do is to keep on correcting the faults till his confidence is restored—and he wants, not unnaturally, an overfull measure of correction. So the industry must keep hammering away—and all I am trying to do is to emphasize some of the salient points at which the hammering must be concentrated, as we who must get the funds from the doubting public see it.

A SIMPLE, DIRECT FINANCIAL PLAN IS A FIRST ESSENTIAL

Looming large in the background of the present dark-colored picture is the financial plan, through which the direct appeal to the public for funds is made. Here, to my mind, three very important essentials stand out. A capitalization should be simple, it should be direct, and it should bear as nearly as possible a unit relationship to valuation. The financial structure should be as scientifically developed and adapted to the special case as is the physical structure to its environment and the service that is expected of it. Too frequently has it been a case of money needed somehow, and any available security marketed, until an almost unintelligible financial conglomerate has resulted. Sometimes the conglomerate has grown out of painstaking but mistaken effort. But however developed, these complicated financial structures should as rapidly as possible be abandoned, even if suffering comes to former investors. A piece of physical property is scrapped in the stride forward, but herculean efforts are made to save a financial plan equally faulty or outgrown. The desire to save innocent investors from loss is rightfully ever present, but it is a mistaken sense of justice to continue raising money on a plan that only multiplies the ultimate victims. The public utility runs on indefinitely, and the greatest good of the greatest number may demand a drastic course. That financial reorganization will be brought about on an extended scale to insure success is inevitable.

By a simple plan I mean, say, such a one as has raised money for the Detroit Edison Company through all sorts of market vagaries for years, and is still

good, *i.e.*, bonds directly secured by physical property, and common stock also secured by real values. Paying a good dividend as it does, money can be raised on this common stock in ordinary times and the bonds are always in the background, salable for lower-priced money or when stock money is not obtainable. The Commonwealth Edison Company also follows this simple plan with conspicuous success. Bonds and common stock, as nearly fifty-fifty as possible, is the simple, effective, sound plan. To refer to the Detroit case again, the company, in order to maintain the desirable relation of bonds to stock, issues debentures from time to time, convertible into common stock. Up to the strain of the war these debenture issues had been converted practically 100 per cent, so maintaining the essential bond-common stock basis. Some such simple plan should be the goal of every utility, as an aid to stand the storm of changing conditions.

I have deliberately deferred the mention of preferred stock, because I am inclined to feel that it is a security whose usefulness is perhaps overestimated. It is the intermediate security between the indenture-secured bond, with its right of foreclosure and non-participation in management, and common stock. It has a lien on earnings ahead of common stock dividends, and so makes an intermediate appeal in raising funds. Its use still leaves the financial plan very simple, but I think its very prevalent use is closely associated with the fact that as a rule too much of the needed funds have been raised on funded debt, and so sufficient margins have not been left to put common stock on a substantial dividend basis and so to make it a dependable financial medium.

Of course the increasing sale of any stocks tends, if the voting power is attached, as in my judgment it always should be, to distribute ownership, and there is often fear lest this process will divert control from a particular quarter. Control of the public services, however, should be allowed to go where it will and management should depend on the competence of its service for its retention. Fear of loss of control again arouses public suspicion, which is quieted the more nearly a given community owns or has the clear opportunity to own and manage its local services.

Here again the war comes in with its lessons. Its strain brought many situations to their knees because bond rates were limited in so many cases to 5 per cent or only a long-time bond was issuable, and no company could afford to sell them. So resort was had to bond-secured notes and every ingenuity of financial device. But the lesson was this: just as the service at cost plan depends on unlimited fare fluctuations to meet changing costs, so deeds of trust must provide for interest rates and maturities and other features such as call figures, tax provisions, etc., as will from time to time best meet changing or emergency market conditions. It will take great care to develop in deeds of trust offering these flexibilities the substantive features of security and equality of lien unimpaired, without which a bond becomes such in name only. It can and should be done, however. Similar flexibilities can also be applied to preferred stocks to advantage, while retaining equality of rank. Efforts have recently been made in both these directions and they are not only advantageous in themselves, but bring the great advantages of simplicity of capitalization within easier reach.

Weakness of Holding Company Financing

Direct capitalization and the holding company security come into immediate conflict. The holding company security, supported by the pledge of the direct obligations of several operating properties, contains a diversity factor strength which has been strongly argued, and for certain purposes and in particular instances has its advantages. It is a fact that during the war the holding company in some cases facilitated the raising of money, but on the other hand there were many cases when the inter-relationship of indirect ownerships made a way out almost impossible. But as a permanent means of satisfactorily financing the important street railway companies of the country, it is difficult to find justification for it. It is fraught with possibilities of grave abuses, and for that reason and because the holding company is not subject to commission control it leads to strong local distrust and criticism. Then, too, its securities, in the case of the large property, are as a rule not so salable as the direct obligation of the operating company itself, provided the capitalization has a simple structure. In the case of smaller properties the benefits of the holding company are of course often many and real, and are locally appreciated, but there can be no doubt of the soundness of the practice of selling to the public the direct obligation of the larger operating properties themselves.

Over-capitalization still exists with many of our street railway systems. This fact, I think, cannot be gainsaid, and where it obtains cannot be set aside as irrelevant. I am afraid a great deal of effort will be yet wasted in attempts to preserve an unjustifiable set up in the hope that chance and returning general prosperity and the continued growth of the country will still take up the slack. These will in all probability be destructive rather than constructive efforts. It will be much better to make opportunity out of the present difficulty to get started right. It is often argued that the fixing of a fair return on a fair valuation reduces the amount of capitalization to relative unimportance, because the allowed return will go only so far as it will. If there is not enough to reach common stock dividends, for instance, they merely will not be paid. Non-readjustment of capitalization in such cases distorts the idea of real value and the conception of the proper relation between securities of different classes, and maintains public suspicion.

The man in the street will not let up his fight against a capitalization that bears no reasonable relation to valuation. The principle of an aggregate par value of securities to equal valuation must sooner or later be accepted, and the sooner the better. Massachusetts has been much laughed at in the past for its rigid capitalization statutes, yet the properties in the state have continued to grow, and now when the public good will means everything in the street railway struggle, the knowledge that everybody has, that capitalization equals valuation by the operation of law and public control over many years, and that the par of bonds does not exceed the par of stock outstanding, takes from public opposition to remedial legislation one of its great complaints.

It is hard to be drastic, but these are drastic days. Street railway financing today is almost non-existent. During the past year scarcely a dozen purely street railway companies in the United States have raised any money by the sale of securities, and even so each case has been in some way special. This condition cannot continue long and the street railway business as a private business survive.

There is no Moses to lead the industry out of the wilderness. There is no panacea for its ills. Each case is special unto itself and must be laboriously worked out. But a background of sound general principles remain and the more closely these can be followed, the sooner, I feel sure, will the credit of the street railway industry be restored. Credit canot be re-established without earning capacity and earning capacity cannot be achieved in the face of public distrust and opposition, the hydra-headed enemy of the industry.

Claims Association Elects Officers

AT THE FINAL meeting of the American Electric Railway Claims Association, the following officers were elected for the ensuing year:

President, C. G. Rice, superintendent claim department Pittsburgh Railways.

First vice-president, Wallace Muir, claim agent Kentucky Traction & Terminal Company, Lexington, Kentucky.

Second vice-president, W. H. Hyland, claim agent Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.

Third vice-president, Howard D. Briggs, assistant general claim agent Public Service Railway, Newark, N. J.

Secretary-treasurer, E. L. Lindemuth, claim agent Wilkes-Barre (Pa.) Railway.

Executive committee: G. B. Proctor, claim agent Memphis (Tenn.) Street Railway; W. G. Fitzpatrick, general claim attorney Detroit United Railway; T. B. Donnelly, claim agent West Penn Railways, Pittsburgh, Pa.; S. J. Harrell, claim agent Knoxville Railway & Light Company, Knoxville, Tenn.

Service-at-Cost Contract Franchise and State Regulation*

The Relative Merit of Each Depends Largely on Makeup of Public Bodies Involved, but with a Good Board, Service-at-Cost Contract Franchise Has Manifest Advantages

By Edward Dana

General Manager Boston Elevated Railway, Boston, Mass.

STATE regulation has generally come to signify control through a state commission, of service to be rendered and rates charged therefor, and further a nearly absolute power over capital issues, whether of stocks, bonds or long-term notes. The fundamental feature of this plan and its greatest weakness is that it looks at only one side of the financial structure of the company, to wit, its receipts. It has no direct connection with or responsibility for expenditures. The commission suffers no loss and incurs no public odium if its decisions result in financial catastrophe for the company affected.

Service-at-cost franchises have taken several forms. Since I am associated with a company under one of these forms which was previously subject to state regulation, and can speak as to that from personal experience, I will take its features as the ones to be considered. Here we have a state board, just as in public regulation, but that commission is given absolute control over and responsibility for both sides of the ledger. It determines the service, prescribes the rates of fare and dictates the expenditures to be made. It is under a duty to see that receipts are sufficient to provide for operating expenses, meet interest on indebtedness and pay certain fixed dividends upon stock—and the state guarantees that its commission will accomplish this result. If the rates it establishes do not provide the necessary funds, the taxpayer in the district served through the state must make up the difference.

There are advantages and disadvantages in each of these plans of control. From the point of view of the stockholders in times of rising costs the advantages of service-at-cost are apparent. With receipts practically fixed and expenditures increasing, there is apt to come a time when dividends cease and even bond interest cannot be met. In such a time the service-at-cost stockholder is in a comfortable position. The return on his investment, while not large, is secure.

Theoretically, public regulation should not and need not impair the return to the stockholder. The United States

EDWARD DANA

Constitution protects an investor in public service corporations in a fair return on his investment so far as state interference is concerned, and it is as much the sworn duty of public service commissioners as of a court to recognize this. Given a regulatory board, conscientious in its sense of duty to the investor as well as to the public and of sufficient courage, increases of fares would not lag behind the condition which made them necessary. Nevertheless, even with an ideal commission there will be, in periods of rising costs, a certain length of time between the moment when increased fares are necessary and the time when they can be put into effect. Evidence must be collected to prove that the increase is necessary, and this cannot well be done until the time of need has arrived. Public hearings must be had and delays of greater or less extent are sure to occur. Throughout this time of waiting a loss is being suffered, which with costs still rising is not likely ever to be made up, but, rather, goes on repeating itself.

Under our service-at-cost plan what the public does not pay in carfare it must make up in taxes. The tribunal controlling the fares is responsible for seeing that they produce enough revenue to meet the costs. It is in a position to act quickly and has the incentive for so doing. Accordingly, not only is the stockholder in better position, but the property has a better chance to be completely self-supporting.

In a falling market the position of the stockholder is reversed. The same sag between changes in carfares and financial condition which warrant them is almost certain to occur and tends to be more pronounced. In the falling market this time of sag between the decreased cost of operation and decrease in carfare furnishes an opportunity for profit to the stockholder and of increased dividends. I said the length of this sag was apt to be greater if anything. It is more difficult for outsiders to present evidence to a commission that carfares should be reduced than for a company, in possession of all the facts, to prove that they should be increased. Delays from litigation are apt to be longer, and the same opportunity for delay, which on a rising market may spell receivership for the company, now works to the advantage of the stockholder. The same thing would be true in a period of development in the industry when rapid improvements, new inventions or changed methods of operation reduced net costs even though general costs were increasing.

If, during the last twenty years, the purchasing power of the dollar had been steadily increasing instead of decreasing, we would probably not have heard much agitation over service at cost. Owners of properties would have preferred the speculative chance of making a profit over the security of a moderate but fixed return on capital. but so long as the value of the dollar is on the decline, I believe the advantages to the owners are in general the other way.

Advantages to the Manager

From the point of view of the operating manager, there are many advantages in our service-at-cost plan.

A regulatory commission cannot acquire the knowledge and understanding of the properties, needs and possibilities of a particular system that can be acquired by persons active in its management. The regulatory commission is apt to think that things which may appear desirable can be done without undue burden, although the commission does not know how. It is apt to take the position that the management can and will find a way if it is ordered to do so. It is apt to be suspicious of an honest exposition of a case because some other company has put something over in times past.

With service-at-cost, the public board of control is just as much, in fact more, interested in whether a suggested rerouting of cars, additional transfer privilege or construction of a new line is a sound business proposition as is the operating manager. Furthermore, as this board selects its manager, it naturally has confidence in him. If he does not merit such confidence, he ceases to be manager.

Operation under such a plan is therefore simpler than under a regulatory commission. Less time is wasted in unnecessary hearings on fantastic suggestions or ill-founded complaints. Changes in routings, time tables, transfers or rates of fare can be made when needed, instead of being made when permitted.

At the beginning of the third trustees' year in Boston, after a full year's operation on the 10-cent fare, operating costs faced a substantial increase due to a $3.56 increase in the price of coal and an advance of 16⅔ per cent

*Abstract of paper presented at the convention of the American Electric Railway Transportation & Traffic Association, Atlantic City, N. J., Oct. 3-6, 1921.

in wages made by an arbitration board. It was estimated that by the end of the year this increase would amount to $3,000,000. The public board in control at once faced the situation. The manager was enabled to act immediately and institute economies so that the actual increase amounted to only $353,336.44.

The efforts made to rearrange the service quickly, curtailing where possible without impairment of the service, resulted as follows:

52,000 less tons of coal were burned.

837 less accidents occurred.

817,299 less miles were operated.

757 less men each week on the payroll.

That this was not done by sacrificing the property is indicated by the fact that there was

31 per cent reduction in defective rolling stock.

23 miles of track were rebuilt or repaved.

113 new cars were added to the rolling stock.

$2,000,000 allowed for depreciation.

Four districts of local 5-cent fares established.

13,189,620 more revenue passengers transported.

No public hearings were caused and no hostile newspaper attacks made.

Deficit Changed to Surplus

A unified and concentrated control of management resulted in men and management attacking the problem courageously and the car rider seemed to realize that it was his problem which was being solved. A deficit of $1,457,415.82 was changed to a surplus of $131,985.01 in nine months without sacrificing maintenance or proper allowance for depreciation and with no increase in carfare.

It is my opinion that, had such a situation existed under private management and state regulation, much of the management's time would have been required at public hearings listening to abuse and preparing elaborate defenses, instead of accomplishing the job of efficient and economical management to meet existing conditions of increased costs and arbitration awards, and that no decision would have been rendered in time to meet the situation.

No Ills from Public Operation

It is apparent that, during the period of operation referred to, the ills frequently said to accompany public operation did not exist under this plan. Some of these may be cited, such as the invariable increase in employees, the drop in morale and efficiency, camouflaged accounting, cost put on taxpayers to secure popular support through low rates, withdrawal of values from taxation. The payroll employees have been on a strictly business basis, the morale and co-operation of the force never better, the accounting exactly as prescribed and used by all street railways, the fare self-supporting, and cost not assessed on taxpayers, the amount paid in taxes greater in amount than previously, but on the same basis.

What I have just said is all based on the assumption of a board of control composed of able, honest, zealous men. If such a board were made the football of politics, composed of politicians holding the position merely for what each personally could get out of it, little of what I have said on this score would be true.

In such a case a manager might be ordered to put unnecessary men to work, to operate service when and where it was not needed, to do divers things, inefficient, wasteful and contrary to his sound judgment, and when the day of reckoning came find his reputation as a manager sacrificed for the political ambition of his board. From the manager's viewpoint, I should say that given an equally good board I would prefer the service-at-cost plan, but with an equally bad board, public regulation. The bad regulatory board could not do so much harm in so short a time.

Advantages to Public of Each Plan

What are the advantages of either plan to the public at large?

The answer must be much the same as from the manager's point of view, although the type of person who appears at hearings of public commissions, as self-styled representatives of the public, would probably not agree. That gentleman styles every increase in carfare as an outrage and robbery, every rush-hour train as cattle cars, and universal transfer as divine right.

In the long run it is better for the public to have its utilities operated efficiently with a fair return to the investor than to be carried for a time at a carfare too low or in a manner too elegant to pay costs. Any savings made by efficient management in the long run benefit the public, either by direct improvement in service or reduction in carfare. I believe that in Boston a great majority of the people accept this view. Increases in carfare from 5 to 7 to 8 to 10 cents within a period of twelve months were accepted with so little objection as to be negligible. In my opinion this was due to confidence in the personnel of the board of trustees and the realization that the management was conducted in the interest of the public, and that money paid in carfares only went to meet necessary costs and not to the advantage of private investors.

Makeup of Board Deciding Factor

From what I have said, you will gather that in my opinion the relative advantages of these two systems depend largely on the makeup of the public boards involved.

The Massachusetts plan attempts to insure the presence of a good board by providing a term of office of ten years. A long tenure gives the value of experience and the intimate knowledge acquired from year to year. It furnishes incentive to efficient management because any mistakes made, whether intentional or unintentional, are pretty sure to come home to roost before the term of office of the men responsible for them has elapsed. There is time in which to demonstrate ability, to disclose incompetency or dishonesty. It seems to me that the chance of having a board of the desired standard is much greater under such a plan than with the regulatory commission.

Men who would not be willing to serve on a regulatory commission because of the limited nature of its authority and the lengthy hearings to be attended are willing to give their time to a public service where they may really do things of benefit to their community and which they may view with just pride. The field of the regulatory board is limited to a wise, semi-judicial restriction of others. It is a highly important and honorable position. The service-at-cost board has the opportunity for large achievements and the satisfaction which comes from the accomplishing results, however great the obstacles. It is this joy in playing the game which keeps many a wealthy man in business after he has amassed all the wealth he can desire. This element in human nature will always assist in maintaining a high standard of capacity in a board managing for the public such a service as this in a large community. The larger the problem, the higher the caliber of men who will be willing to attack it, although the money compensation be little or nothing.

One other subject should be touched upon, "The financing of the company or raising new capital."

Any system in a growing community is constantly in need of capital for extensions and improvements. As the community spreads, lines must be extended and power plant enlarged. As it increases in population, more cars must be run.

Our experience with respect to new capital has not yet been encouraging. Investors have not as yet drawn the distinction between the condition of our company and that of the railways in general. It was thought at the time the Massachusetts act was passed that the guarantee of dividends would make the raising of capital easy, but a 6 per cent stock at par is not marketable and as yet we have not reached that maximum rate and since the present plan is only ten years' duration there is not the certainty which a gilt-edged bond possesses.

Under private management there is practically always some financial group in control which is interested in seeing that the company is properly financed. Under service-at-cost this assistance is lacking.

It remains to be seen whether, when the money market is more nearly normal and street railway securities are in better favor, the certainty of fixed return of the Massachusetts plan will compensate for the loss of speculative

possibilities and the loss of financial backing of strong concerns.

Street railway investments have been hit so hard of late years that there is little market for anything that bears that label.

The operation of a street railway system is much before the public eye and the personnel is constantly in touch with the public at large. Such an organization cannot produce its best work if it is the football of the daily news, its management always defending itself before hearings, etc. No business can prosper when every one is operating it, much less a business on a fixed return with as small a margin as exists between income and outgo of a street railway.

Indeterminate Franchise Indorsed*

By R. I. Todd

President Terre Haute, Indianapolis & Eastern Traction Company

R. I. TODD

ONE of the most striking epigrams in Mr. Dana's paper is contained in the next to the last paragraph, *i.e.*, "You cannot regulate one-half of an industry with success." This terse statement presents in a nutshell one of the fundamental difficulties which practically all public utilities have been forced to operate under and which seems to be so little appreciated by the general public, or even by the majority of the best-informed business men. The public authorities who regulate the receipts of public utility corporations should also be held responsible for their operating expenses and net earnings so far as this is reasonably possible. The plan suggested by Mr. Dana, under which the Boston Elevated Railway system is now operating, seems to combine, in a most advantageous way, the control by public authorities of both the income and outgo of the company. Outside of the State of Massachusetts, however, no public utility operator has been able to convince the lawmakers that the operating deficit of a utility should be charged against the tax duplicate of the property owners, and even in Massachusetts, if I am correctly informed, the Boston Elevated Railway practically enjoys a monopoly of this most valuable feature of the service-at-cost legislation. In the Middle West it would be extremely difficult to get any legislation of this kind placed on the statute books.

With possibly the single exception of Massachusetts, the two most generally considered plans of utility control and of operation seem to be the service-at-cost plan and the indeterminate permit method of operation. Under the latter plan, in theory at least, a utility is practically assured by the State that it will be permitted to earn a reasonable return on all property used and useful for the public, but that the chance of speculative profit is practically given up.

The particularly advantageous feature of some of the so-called service-at-cost franchises is an automatic rate of fare, dependent solely upon the receipts and operating expenses of the company. When an increase in rates of fare with an indeterminate franchise becomes necessary, relief is usually not granted until the company has been seriously affected financially, and if further relief is required usually there is considerable additional delay.

However, outside of this advantage of an automatic fare adjustment, there are many disadvantageous features to service-at-cost franchises. One of these is the lack of incentive to the company to operate as efficiently and economically as under an ordinary franchise. Even the provision by which a greater rate of return is permitted to the company as rates are lowered does not thus far seem to have resulted in securing low rates of fare. A second objection is the extreme difficulty of securing a wage scale which is fair to the public, the utility company and the employees alike. Where unreasonable demands are made for increased wages and the fallacious argument is used that to grant them merely means the adding of half a cent or a cent to the fare, the company officials are placed in a disadvantageous position, and arbitrators in many cases grant an increased rate or make less of a proposed decrease in rates, where the expense is simply passed on to the public.

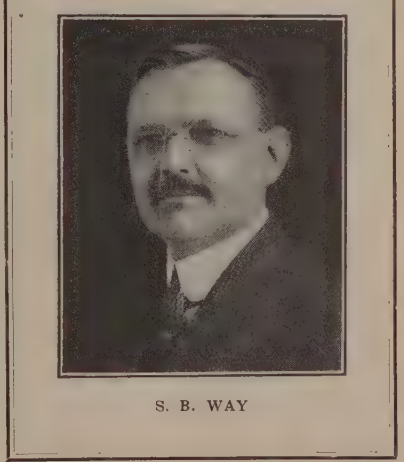
While no one will claim that an indeterminate permit plan is a complete solution of the franchise problem, of all the plans which have become effective it seems in general to be the most advantageous. Under this plan the rates of fare as well as the rates of return are directly under the control of the Public Service Commission, and the theory of operation is that as long as the corporation gives efficient and satisfactory service its franchise continues indefinitely and the state guarantees a fair rate of return on the money invested, or an investor can sell his stock or bonds to some other person at approximately the price which he paid for it. This form of permit also gives to the cities and towns what might be termed "home rule" for existing utilities, to the extent that they may pass any reasonable rules as to the quality of service to be furnished, with the direct right of appeal at all times to the courts.

*Abstract of discussion on Mr. Dana's paper presented at the annual convention of the American Electric Railway Association, Atlantic City, Oct. 4, 1921.

Contrasted Advantages of Service-at-Cost Contract Franchises and State Regulation*

By S. B. Way

Vice-President Milwaukee Electric Railway & Light Company



S. B. WAY

THE purpose of regulation is to safeguard the public interest by securing good service at lowest cost. To fix standards which will insure good service and at the same time avoid waste requires the services of men experienced in the industry, possessing good judgment and removed from local political influence. State regulation makes possible the continuous employment by the state of the necessary high-grade, experienced specialists at not much, if any, in excess of the cost of the same service if procured singly by any individual municipality. Moreover, such people if employed by the state are less likely to be subject to local political influence than people depending upon local favor for their jobs.

State regulation, however, as practiced up to the present time has not been made automatic. Under present procedure it is necessary for the utility to establish a long record of inadequate earnings or even absolute insolvency before relief can be had. The framers of our laws might just as well have made a complete job by definitely requiring the commissions to function in

*Abstract of discussion on Mr. Dana's paper, presented at the annual convention of the American Electric Railway Association, Atlantic City, Oct. 4, 1921.

limited time or even to establish automatic rates.

Service-at-cost contracts are nominally automatic. As developed up to the present time they appear to have been conceived along rather too narrow lines. In some cases proper provision has not been made for future replacement of physical property or the conservation of the investment at the termination of the service-at-cost contract or a determinate franchise. They have not provided for necessary flexibility in rate of return to meet changing money market conditions. Unless these elements can be satisfactorily covered, such contracts are likely to result ultimately in service being given at less than cost.

State regulation being statewide can, of course, and in fact does, attempt to meet the problem of regulating utilities serving more than one municipality. This problem is particularly acute in the railway business, where poorly paying suburban lines serving communities contiguous to but beyond the corporate limits of the city must be supported by the city service. It would be difficult to negotiate a fair service-at-cost contract with a city which would recognize and compensate for the losses on lines serving suburbs from which the city receives no benefits in taxes, increase of population, etc. Theoretically this situation can be met with special legislation by some form of district organization, but such special governmental subdivisions appear to be more closely related to some form of public ownership and operation than to service-at-cost contracts which must depend upon obtaining a fair trade between privately owned utilities and the municipalities served.

Where state regulation is possible, the legal and economic advantages seem to lie with properly conceived and executed state regulation, while the political advantage seems to be with local service-at-cost contract franchises. Under such contracts the service may cease to be a political football, and definite bases can be established for promoting desirable co-operation on the part of the city in regulating street traffic, economical routing of cars, paving, saving needless litigations, and like matters.

Some attempt has been made under various forms of regulation to provide an incentive for privately owned and operated utilities to achieve maximum efficiency. Generally the plan adopted is not sufficiently comprehensive or is based upon negative rather than positive considerations. No examples are at hand of service-at-cost contracts embodying provisions for rewarding both the capital and labor employed in the industry for improved efficiency, as compared with some standard. No form of regulation will be wholly successful in producing the best service at the lowest cost which ignores the principle of a definite reward for unsual effort. Both service-at-cost contracts and state regulation offer ample opportunity for incorporating in their respective schemes adequate provision for inducing and rewarding the best service on the part of labor and rewarding capital for foresight and efficiency in management.

It is doubtful if there is any one solution or formula generally applicable as a cure for the present ills of our industry. It is certain there are great differences in local conditions, and each problem must receive special study and treatment.

Car Purchases May Be Financed Through Car Trusts*

S. M. CURWEN

One Car Company Alone Has Taken 3,000 Notes in Varying Amounts—No Defaults Have Been Made

By Samuel M. Curwen

President of the J. G. Brill Company, Philadelphia, Pa.

MANUFACTURERS, as public spirited citizens, interested in civic affairs as well as in the need of transportation for their employees, should take a real interest in transportation matters in their respective localities and assist regulating bodies and railway managements in many ways which would tend toward more satisfactory transportation conditions. I believe if this were done many of the misunderstandings arising between the management of electric railways and the authorities in the community in which they operate would be obviated.

It has been suggested that it would be entirely proper in this paper to refer to the question of financing purchases of electric equipments and cars, as this phase of the industry also shows the interest of manufacturers in the electric railways.

In 1919 it became apparent that it would be difficult for railways requiring equipment, which they were unable to get during the war, to finance the purchase of it through the issue of bonds or the regular channels by which money heretofore had been available.

A plan was therefore devised for leasing cars under the car trust plan, not only to large roads, but to the small roads as well. The manufacturers of electric cars and their equipment found that bankers could be interested in the purchase of car trust securities and in their resale by them to the public even covering equipments for small roads if they could be offered in large enough amounts. Under this plan there was to be deposited a number of small groups of car trust obligations with a trust company as trustee, enabling the trustee to issue coupon certificates of interest against these purchasing company's notes held by them. These certificates of interest were issued in series from time to time and sold to bankers in Philadelphia, Chicago and Baltimore.

Thus the cars are leased to the railway company under an agreement providing for the payment of a certain cash rental upon shipment and for deferred rental represented by the notes or lease warrants of the railway company. The cash rental and the deferred rental represent the purchase price of the cars plus the interest on the deferred rental payments. The title to the cars is retained in the vendor or lessor and the lease or agreement is recorded in the proper office as prescribed by the specific statutes of the respective states. Nearly all the states now have special statutes providing for such conditional sales of railway equipment.

The agreements contain the provision that upon payment of all the lease warrants and covenants provided for in the agreement the title to the cars shall automatically vest in the railway company prior to which the title remains in the vendor.

This plan for the purchase of cars has been found very convenient by many electric railways, and the payments have been so arranged that the lease warrants mature monthly in small amounts, comparatively speaking, over a period of from thirty-six to sixty months, thereby enabling the railways to make their payments from increased earnings and economies derived from the use of new equipment, especially safety cars, of which large numbers have been sold on this plan.

This method of financing proved so satisfactory, both to the purchasers

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and to the manufacturers, that it seemed advisable to organize a financing company which would be larger in its scope than the method first used. With this in view, early in this year, a company known as the "Electric Railway Equipment Securities Corporation" was formed by the General Electric, Westinghouse and Brill companies, having a capital of $1,000,000. The purpose of this company is to buy from the manufacturer lease warrants or car trust notes taken by the said manufacturer from the railway in payment for the sale of their equipment. When a sufficient amount of these lease warrants accumulate they are deposited by the Electric Railway Equipment Securities Corporation with a trustee and the trustee issues against these lease warrants certificates of interest with coupons attached which are sold to bankers for distribution to the public. The certificates bear the guarantee of the Electric Railway Equipment Securities Corporation, covering the payment of principal and interest. This form of security is readily salable to investors.

This same method of selling cars has been carried on by one or two other car manufacturers in a manner I think entirely satisfactory to them, and to their bankers and customers.

The Brill Company alone has sold over one thousand cars on this plan, and has taken from the purchasers in the various transactions, covering the sale of these cars, more than three thousand notes or lease warrants of varying amounts. Many of these purchasers now practically own their cars and have been able to pay for them out of increased earnings, in this way requiring no long-time financing. I think it is a proud record for the railways to have attained when I say that of all the thousands of notes given no default has been made making it necessary for the trustee to repossess the cars. The manufacturers make no profit from this financing transaction, which clearly indicates their interest in the present electric railway crisis.

Terminal Service Possibilities of the Electric Railways*

The Opportunities of the Electric Roads to Supplement the Services of the Steam Trunk Lines in Freight Terminal Service Are Set Forth

By J. Rowland Bibbins

Manager Department of Transportation and Communication, Chamber of Commerce of the United States

HAVE electric railways exhausted their earning power? From a national viewpoint this question must recur continually to the mind of every one sincerely interested in the great business of transportation. The answer seems today to encompass the hopes and fears of the entire industry, to the perfection of which so much energy and capital have been given during the last three decades. But have all the possibilities within our grasp been uncovered? Has development work come to its climax? And if so, what of the future?

The history of transportation development is a romance perhaps only half told, the story largely winding itself about strong personalities and to a large degree illustrating the theory of the "survival of the fittest." Systems have come and gone—toll roads, stage coaches, horse-drawn canal boats, the Mississippi River packet, the American clipper, railroads of hybrid gages, cable cars, storage battery cars, surface contact systems, etc.

Each new agency has developed its own peculiar service possibilities and operating methods. The economic acid test of all has been the ultimate ability of the industry to stand squarely on its own feet and perpetuate itself automatically through external and internal development. And the whole tendency of this development over the long period has been better and more service per unit of revenue, higher speed, improved efficiency and equipment, more stable employment of capital, greater dependence of the public upon the service rendered and a higher order of utilization of the operating man power. Shall this same acid test be applied in the future or have we a more refined formula?

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J. R. BIBBINS

The strangest aspect of this transport development is that the electric railways costing about $3 per dollar of annual gross revenue have confined themselves to passenger business alone, while steam railroads have reduced their costs to only $2.80 per dollar of revenue by developing both passenger and freight. On the steam railroads freight revenue is normally three times passenger revenue; it is only a negligible fraction of the gross revenue of the electric railways. The steam lines are available for practically continuous traffic; the electric lines are used to only one-fourth of their investment and capacity, lying idle during most of the twenty-four hours. It is a fair question whether this situation is either sensible or economic.

City Distribution and Terminals

Outside of the main-line mileage, steam railroads have perhaps half of their investment in terminals, sidings, yards and other trans-shipping facilities. These terminals are necessary in every city, large or small, and occupy widespread city areas of high land values, yet they have been acquired only by the mightiest efforts, at huge expense, and often under conditions of most bitter competition. The entire city terminal problem is today the most serious one confronting the nation's transportation systems, requiring the utmost co-operative effort to unravel. Electric lines have a large responsibility in this matter. They gridiron the entire areas of our cities and industrial centers in a manner utterly impossible for the steam lines. They have the same gage, with few exceptions; they intersect the steam lines at a thousand places; their roadbeds are usually more substantial; they reach every industry, very many of which are inaccessible to the steam lines except through long trucking hauls from the freight terminals. They reach literally millions of retailers whose enormous tonnage, in and out, moves likewise over the city streets.

The next question is one of what is best for the city. What is the cheapest, the quickest, the most convenient and the least unsightly method of transporting over our city streets from the railroad terminals perhaps 200,000,000 to 300,000,000 tons per year? Shall it be in combination with the broad network of electric railways already established in the cities and only used to one-quarter advantage? Will not future civic efficiency and welfare greatly depend upon the solution worked out for city terminal transport?

Very few American cities have downtown streets of adequate width and capacity for present needs, to say nothing of future needs. Sixty-five foot streets, more or less, are the rule, which width provides for only one line of vehicle traffic in each direction between car tracks and side parking. Nevertheless, general business in our large active cities is growing at such a rate as to double in eight to thirteen years, and the service of business largely centers around finance and transportation, both freight and passenger. How are

*Abstract of paper presented at the annual convention of the American Electric Railway Association, Atlantic City, N. J., Oct. 3-6, 1921.

we going to transport double the present traffic volume of our cities? Already the question has become so acute that a definite movement is on foot to develop future indutrial centers in widely distributed and relatively uncongested town units of small size. This means that the economic burden of the big city has become too great a drag on business and occasions too great a spread between basic production cost and selling price.

Co-ordination—What Does It Mean

We talk glibly of conservation—making the best use of what we have, and developing our resources to their utmost. Quite as glibly we talk of "co-ordination of transportation facilities"—finding the best field for each agency, making them work together instead of at cross purposes, yet how little real co-ordination has been accomplished in the transportation field even during the war when the utmost team work was imperative.

It seems to me that a good chance to start this team work is in putting the electric railways—urban, interurban and rapid transit—to further use as terminal transport agencies, interchanging traffic in the most intimate fashion with the steam railroads and using motor transport for the final operation of delivery where direct delivery cannot be made as efficiently. This great city railway network should transport during off-peak hours much of the tonnage that now occupies the city streets in a vast multiplied fleet of unregulated, unstandardized, unorganized, and more or less unsuited vehicles, which vehicles contribute perhaps the majority of the congestion of which they themselves complain and which undeniably makes adequate passenger transportation of the cities' millions a difficult and in some cases an impossible problem. This is not alone a matter of corporate profit, but one of civic necessity—to make city life more endurable under growing traffic. This relief would automatically come through the consolidation of the tonnage into large units of rolling stock. The electric system could be used to best advantage between main downtown and outlying substations, the final delivery to be made more readily by lighter delivery motors.

At first there will be many difficulties to be overcome—trans-shipment facilities, routes, regulations, rolling stock, track gages in a few cases, franchise legislation and especially the opposition of railroads, trucking companies and a hostile public. Nevertheless, the true economic test should, and I believe will, ultimately prevail. The cost of extra handling might be very greatly reduced by the use of multiple-compartment cars loading directly at the railroad freight houses, moving to the substation and thence, without breaking bulk, by motor to the consignee, where large volume scheduled service is required. The problem of suitable rolling stock can be worked out by means of well-built, sightly express cars, which have been already developed on some interurban systems. These cars when well maintained should be no more unsightly or noisy nor contribute to congestion more than the miscellaneous fleet of motor vehicles now used at all times of the day in the same service over our city streets. In several cities it is already the practice to utilize the tracks in certain streets for hauling standard steam rolling stock from interchange or local yard to city destination. What is now needed is a more thorough development of the plant. The railroads are working on a "store-door delivery" plan, such as has been in use in Canada and England and formerly in Baltimore and Washington. If a universal store-door delivery plan is in fact developed which disregards the 45,000 miles of electric street railway track as an economic factor it will be unfortunate.

The greatest hope in such a co-ordinated plan of railroad-railway-motor terminal transport is the ultimate benefit to the whole people. Through consolidated loading the street congestion will be reduced. By the more intensive use of tracks already laid the investment will be put to more economic usage. Duplication in carrier equipment will be avoided. For the road vehicles the expensive delays and time-eating long hauls will be done away with and converted into faster short-haul runs and greater earning power. Roadways will be cleared for a better use of passenger transport, and a good part of the enormous city freight business will be done largely under cover.

But most important, the new economy will be clean cut. For the electric lines there would result new revenue, now utterly unobtainable, at no additional cost to the city or to the public, and little to the carriers. For the city there would result a large decrease in wear and tear on city streets; for the people, in addition to the improved service and the possibility of reduced delivery expenses, there would be the possibility of a relief from the necessity of boosting passenger fares; the new revenue from freight and express should become such an important factor in the total revenue as to bring about not only relief from the pressure for increased fares, but also the possibility of improved passenger service. It is needless to point out the important influence of such increased revenue upon the financial credit of the electric railway industry.

Considerations Affecting the Market for Street Railway Securities*

Customer Ownership of Securities Should Be Encouraged—Modern Experience in Public Utility Financing Should Be Studied by Railways—Tax Exempt Securities Impede Financial Progress

By H. M. Addinsell

Harris, Forbes & Company, Chairman Public Utility Securities Committee, Investment Bankers' Association of America

A FEW weeks ago we were asked to consider the purchase of a substantial amount of bonds, the proceeds of which were to be used for the reconstruction of one of the French cities shattered during the war. The bonds were to be a direct, and the only, obligation of the city. It probably received about as continuous unfavorable financial publicity in the four years of the war as any city in the world has ever received. It was an almost constant mark for German shells, its industries were destroyed, a large proportion of its dwellings and many of its historical edifices were damaged, some of them hopelessly beyond repair. But a reconstructed and probably better and more sanitary city is arising, phoenix-like, on the ashes of the old city. The economic reason for the permanent existence of an important city at this point is unquestioned and from an intrinsic point of view there is probably little doubt that the bond issue referred to will make a perfectly safe investment. However, to be an attractive proposition to investment bankers a bond issue has to be not only safe but also salable.

The very mention of the name of the city arouses our sympathies, but by that same token it does not arouse a desire to loan funds to that city on an investment basis. If our sympathies were strong enough and our pocket-book permitted we would be glad to make a contribution toward its reconstruction as a charitable act, but these people do not want charity. After careful consideration we reluctantly came to the conclusion that the American market would not take these securities at this time on an investment basis; that is, on any reasonable terms that the city could afford to meet, and we were obliged to decline the business.

There is at least some parallel between the position of the French city referred to coming into this market for money and that of our own street railways at the present time.

If we are to deal constructively with the situation that confronts us we must face frankly the facts of that situation. One of the facts is a strong, definite and not unfounded prejudice in the minds of investors against street rail-

*Abstract of address presented at the annual convention of the American Electric Railway Association, Atlantic City, N. J., Oct. 3-6, 1921.

way securities at the present time. I refer to the investing public as a class, for the situation intrinsically and fundamentally is not nearly so bad as the impression that has been created in the public mind. Those who really know the facts know that the answer to the constantly recurring question in investment circles, "Can street railways come back," is an affirmative one—they can, they will, and they are already on their way.

We can base our discussion on the proposition that the street railway, as the Federal Electric Railways Commission notes, is "the most nearly adequate, reliable and satisfactory system available for transporting the maximum number of people through the streets of our cities with the least interference with the use of the streets for other purposes of public ways." Perhaps there may be isolated cases, especially in very small communities, where motor buses will serve the purpose, but we have already had a practical illustration of the essential nature of the street railway transportation in at least one large city.

If we are correct in our assumption that the street service is an essential and indispensable part of the machinery for conducting the business of a substantial community, we find there are still many other considerations that affect the market for the securities of the street railway companies. Already I have referred to the recent past history. In addition to the rise in costs, which precipitated the troubles in the immediate past, are a number of other conditions—franchise troubles, franchise abuses, honest and dishonest politicians, topheavy capitalizations, the jitney bus. Generally speaking, a given community has the idea that the street railway is a foreign corporation; that is, it is owned by outside capital, and generally speaking it is correct in that view. Of course in the last analysis the public owns the street railways as it does all the other utilities, and whether or not it realizes it it has a direct or indirect financial interest in the success of these enterprises. The most positive cure for the impression above referred to lies in the sale of stocks of these companies to the local public served; in other words, changing the status of the public from that of *customer only* to that of *customer owner*. This has perhaps not been possible in the past because of the difficulty of making attractive stock issues of the street railways.

A note of warning should be sounded in connection with sales of stocks to customers and employees. The customer should not be asked to pay more than the general market for the class of security offered him. The stock should be sold on a complete statement of the facts and weak securities should not be gilded over with generalities. Moral consideration should preclude these practices, but if indulged in the inevitable reaction will be disastrous to the future development of this important means of supplementary finance.

I have spoken of some points with which all of you are familiar and regarding which you all know a great deal more than I do. The elimination of the prejudice of investors against street railway bonds will take time and can only be accomplished by a persistent and thorough educational campaign on the part of your companies. You have nothing to hide, and if you had there would be no use in trying to hide it. The most you can expect and all you are entitled to receive is a fair deal from the point of view of the money legitimately invested in your enterprises. This you are entitled to, and enlightened self-interest on the part of the public will eventually result in your getting it. It is up to you to do the enlightening. You must demonstrate to the public that the service-at-cost franchise will make it possible for it to get the best service at the lowest cost and will give you a fair return on the money invested in your business.

New money cannot be attracted to your enterprises without a reasonably certain prospect of its receiving a fair return. Such service at-cost franchise should provide among other things for some reasonable premium on good and efficient management. Motor bus competition must be eliminated and the paving of streets recognized as a municipal function and not as a burden to be imposed on the street railways. Capitalization should be set up on sound and conservative financial principles. These things will take time and patience and they must be done in the open. Try to get the public served as financial partners in the enterprises, but at least make them partners to the extent of sharing your knowledge of the facts. These are merely signposts pointing the way in general to the restoration of street railway credit.

How Taxes Affect Financing

To these specific considerations with respect to the street railway industry, however, should be added another general consideration that applies to the raising of money by all private corporations in the United States. By private corporations I mean all the corporations other than those representing the state, city or other governmental subdivisions. For the purpose of this discussion I shall call the latter governmental corporations. These governmental corporations since the advent of the income tax have enjoyed an unwarranted advantage over the private corporations in the matter of raising money for carrying on their business. I refer to the fact that, generally speaking, the bonds of governmental corporations are exempt from all federal income taxes. The bonds of private corporations are not inherently exempt from any of these taxes, although by private contract a corporation sometimes agrees to pay the normal federal income tax up to a certain small percentage, but this is merely a private contract, and taxes so paid come out of the corporation and are such a small percentage of the total—they cannot exceed 4 per cent of the normal income tax of 8 per cent, disregarding the surtax entirely—that it does not come anywhere near curing the disparity between tax free and taxable securities.

Before the days of the federal income taxes there was about one point difference in yield between average good municipal bonds and average good public utility bonds, but today this is nearly 2 per cent, not because the difference in security has changed, but because, among other things, tax exemption of the governmental securities gives them a very decided artificial advantage, damming up the large reservoirs of capital from these corporations and, from the broader economic point of view, depriving the government of millions of dollars of taxes that it can ill afford to lose and from those who can best afford to pay. Of course there are many sides to this broad question and in the last analysis of course it must be recognized that it is not the exemption, *per se*, of governmental securities that has helped to make it difficult for private corporations to finance, but the confiscatory levels reached in taxing income and which could only be justified as a war emergency measure. That the government recognizes this fact is evidenced by the tax legislation now pending in Washington which will reduce the top rate normal and surtaxes to 40 per cent. If this can be followed by further reductions in the next two years so that the rates more nearly conform to the pre-war level the situation will readjust itself without regard to the United States constitutional amendment referred to.

Present Financing Developments

On talking some days ago with Mr. Mortimer, I told him that I didn't suppose you gentlemen would be especially interested in a discussion of modern developments in public utility financing, as you probably knew all about it. He pointed out that it was so long since the street railways had been able to do any financing that it would be practically a new subject, so I will take him at his word. The series mortgage and the no par value stock are the two outstanding recent developments along the lines of progress. The series mortgage gives flexibility from the point of view of enabling the company to issue its prime security with a maturity and an interest rate to meet existing market conditions. If conditions are such that short term, high rate obligations are the most salable they can be created, or if longer term, lower rate bonds can be sold to advantage they can be created, all having the equal security under the same mortgage.

An equal degree of flexibility to meet varying market conditions is afforded to stock financing by having the stocks issued with no par value. Assuming, for example, that a stock calls for an annual dividend of $6 a share and the market for that class of security calls for 7 per cent, the stock could be under

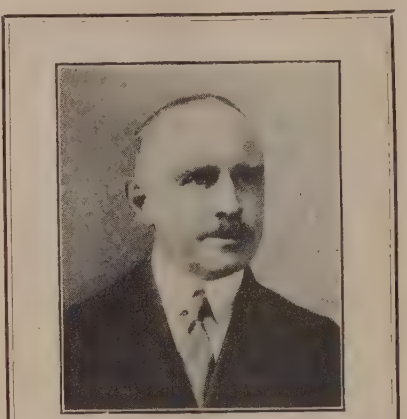
a "no par value" law at 85½ so as to net 7 per cent and thus meet the market, or if in the same case stock could be sold on a 5 per cent basis the price would be 120. This may sound very simple and easy, but of course a condition precedent to the sale of stock is the creation of values and earning capacity for such stock. This in many cases in your industry is neither simple nor easy; in some cases it will involve, among other things, financial reorganization.

In order to sell stocks you must create an investment position for them. This will necessitate in many cases a scaling down of capitalization, both bonds and stocks, so as to make your stocks represent actual investment in the property. No par value stock laws will not cure overcapitalization, for the units represented by no par value stocks of an overcapitalized company would represent such a small amount that they would not be readily salable. So the stocks must be brought down to a basis where the units thereof do represent a reasonable amount of investment upon which you will be entitled to earn a return. Then the stocks will be salable, and the bonds ahead of them even more salable. No prudent investment banker today will buy bonds of a company that has not a good practical vehicle for accomplishing its junior financing.

A public utility property cannot stand still; it must expand to meet the growing demand for extensions and service that is inevitable in our American cities. Though you may have ever so sound a bond situation theoretically, and perhaps only be able to issue your future bonds for, say, 75 per cent of the cost of future capital expenditures, if the means for providing the other 25 per cent is not in hand, then you and the investment banker who handles your bonds are headed for certain trouble. A good plan is to have two classes of stocks, preferred and common, then you have three strings to your financial bow—common stock, preferred stock and bonds.

I do not offer you any quack cures for your troubles. We all know the facts and we know that the situation intrinsically is not as bad as advertised. Do the right sort of high-class advertising to offset the bad advertising you have had. Take the public fully into your confidence and work to get your financial houses in order—by a major operation if necessary. Make the public you serve your partners. Above all, push on with this work, confident and determined to give to the American public the best kind of street railway service that is obtainable at the lowest practicable cost and to preserve for the owners the billions of dollars honestly invested in your great industry. To bring your companies from the clouds of uncertainty and depression to the sunny skies of merited prosperity is surely an undertaking worth while and one worthy of the steel of strong and courageous men.

The Underwriters' Laboratories and Its Work*



G. B. MULDAUR

Inspection of Devices with Respect to Fire Hazard Involved in Their Use Is the Function of This Organization, Founded in 1893 and Incorporated Twenty Years Ago

By George B. Muldaur
General Agent Underwriters' Laboratories, New York.

WE ARE destroying by fire alone every year $500,000,000 worth of property. This is exclusive of the cost of fire protection and insurance. We are having about fifteen hundred fires a day, or nearly one a minute. The United States Geological Survey has estimated that the amount of property destroyed in one year is equivalent to all the gold, silver, copper and petroleum produced during an equal time. Our per capita loss by fire is by far the greatest in the world. These statements are made simply to lay stress upon the value of any movement tending to decrease this waste of life and property and to lead up to a description of the activities of Underwriters' Laboratories, the technical member of the group of national organizations devoted to this important work.

Underwriters' Laboratories is unique in its organization, purpose and methods. Founded in 1893 by W. H. Merrill, its present president, it has built up in its twenty-eight years of life an unquestionable reputation for accuracy and integrity as the recognized authority on matters pertaining to all devices, appliances, machines and materials in respect to fire and life hazards, theft and accident prevention. In 1901 it was incorporated under the auspices of the National Board of Fire Underwriters, whose financial backing enabled the management to secure proper buildings, equipment and staff and to lay out a plan of action which has made it self-supporting.

The purpose of the laboratories is to diminish the enormous fire and accident loss by indicating those materials, apparatus, construction and installations representing practicable standards of excellence. Devices submitted to the laboratories for listing are first tested by the engineers in charge. If they attain to the standard already fixed, a favorable report is prepared. Should they fall below this standard, the manufacturer or inventor is called in conference and in many cases the assistance given him by the laboratories' engineers has resulted in correcting such features as were found to be substandard. When a favorable report has been rendered by the engineers of tests, it is passed upon by one of five councils, namely, fire, casualty, electrical, automobile and burglary. If the vote of the council is favorable the device passes into the class of listed articles. A summary of the report is printed on a card, which is filed according to classification, and cabinets containing these card systems are maintained in the offices of the principal boards of underwriters and inspection bureaus as well as by many public and private organizations and government, state and municipal departments. These are available to the public at large.

In order that any device once passed and listed shall be known to maintain the standard certified by the laboratories' favorable action, three forms of follow-up service have been adopted and may be used at the option of the submitter. The oldest of these, reexamination service, consists of tests made from time to time of samples obtained in the open market by the laboratories' representatives and without the knowledge of the manufacturer. The second, inspection service, comprises tests made by the laboratories' inspectors at factories during manufacture. The third follow-up plan is the label service. This, as its name implies, consists in affixing the laboratories' label at the factory to such goods as are shown to be standard by the tests of the laboratories' inspectors on the spot. In all three forms of follow-up service, should a device be found to be subnormal, the laboratories' approval is withheld until the original standard has been re-established.

The main plant of the laboratories in Chicago contains something over 50,000 sq.ft. of floor space. An electrical laboratory is also maintained in New York at 25 City Hall Place, under the charge of Dana Pierce, vice-president, and a special fuse-testing plant is in operation in Kingsbridge. In these

*Abstract of paper presented at the annual convention of the American Electric Railway Engineering Association, Atlantic City, N. J., Oct. 3-6, 1921.

laboratories, and especially in the main plant in Chicago, every conceivable variety of tests relating to fire and accident hazards is carried on. An idea of the importance and magnitude of some of the tests may be gathered by reference to the recently issued book on column tests which was made at the laboratories in co-operation with the Associated Factory Mutual Fire Insurance Companies, the National Board of Fire Underwriters and the Bureau of Standards. This report consists of 388 pages and took about five years to compile.

Arrangements have been made with the Bureau of Standards and the Bureau of Mines by which these bureaus act as arbitrators in case of a disagreement arising between the submitter of a device and the laboratories in regard to the excellence of such device. Such arbitration, invoked occasionally, has resulted satisfactorily.

The Traction Industry Today and Four Years Ago*

Various Causes Suggested by the Federal Electric Railways Commission for the Condition of the Electric Railways Analyzed to Determine How Far They Prevail Today

By Edwin Gruhl
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EDWIN GRUHL

THE searching inquiry into the state of the industry by the Federal Electric Railways Commission indicated that its problems were not local, but national in scope. The experiences there recited were so common, the difficulties so similar and the opinions of witnesses on every side so nearly unanimous that no doubt remained that the welfare of the industry was dependent upon widespread economic conditions beyond the control of local managements. One company alone, the inevitable exception to the rule, protested that it had nothing the matter with it. History has since proved that this was not true. The malady was too deep-seated to be cured by faith.

The commission's report was issued in 1920. The picture it conveyed was an essential industry with credit impaired, facing a precarious struggle for existence and requiring emergency relief and co-operation of public and employees to avert a serious breakdown. The patient has been in a worse way since the commission voted its condition as acute, but it has met the crisis and is now on the road to convalescence.

A Resurvey of the Causes

A somewhat detailed diagnosis was presented by the commission of the factors contributing to the industry's condition. The causes enumerated are fifteen in number. The first five of these relate to overcapitalization, neglect to amortize this excess capitalization, failure to amortize normal accrued depreciation, payment of unearned dividends and neglect of ordinary maintenance, and overbuilding. In the same group we may place the criticism of underlying companies and leased lines. These causes are historical, and there was no evidence before the commission to lead to the conclusion that they were general. They suggest the diagnostician's inquiry into heredity and youthful indiscretion. They have certainly not been relevant during the past fifteen years of commission regulation. Besides, the fact that roads in receivership or municipally owned are similarly afflicted would suggest these causes as secondary or remote. The contributing cause enumerated as holding companies and banker control falls in the same class. It suggests a reflection on the nurse without whose help, the commission concedes, "many of the operating companies would have gone under before Jan. 1, 1918." Concerning these seven causes no comment need be made in this discussion. If relevant, their present-time effect, though somewhat more removed, has sustained no perceptible change.

Five additional causes enumerated as contract fares, limited franchises, special taxation and franchise obligations, use of regulatory power to compel more and better service, and in part automobile and jitney competition, relate to hardships and conditions imposed by the public authorities concerning which important recommendations were made. How these recommendations have been received and followed will be referred to later.

Cost of Labor

Last mentioned are the economic causes enumerated as increasing demands of labor, the war and the dollar, and the cost of new money. These are, of course, immediate and controlling and merit close examination in the present discussion.

The wage bill represents about two-thirds of railway operating expenses. The average wage of motormen and conductors for companies operating 100 miles and over in 1917 was 31.5 cents per hour. On Jan. 1, 1919, it was 44.4 cents per hour. On Jan. 1, 1920, it was 52 cents and on Jan. 1, 1921, it was 60 cents an hour. A reduction is noted as of Aug. 31, 1921, to 57.6 cents. Out of the sixty-four companies included in this average, twenty-six have reduced wages since Jan. 1, 1921, the reduction in wages made by these companies averaging 10.7 per cent. Yet wages still show an increase of 83 per cent over wages for 1917 and are still 20 per cent beyond the War Labor Board standard.

Cost of Material and Equipment

The commission's report refers to increases in material and equipment prices for the latter part of the year 1919 as compared with the year 1915. For electric railway equipment this increase averaged 64 per cent. For general supplies and raw materials it averaged 178 per cent. On Nov. 1, 1920, the increase in price of electric railway equipment over 1915 prices had grown from 64 per cent to 110 per cent, and a similar comparison as of the middle of 1921 showed a decline to 94 per cent. For the raw material, the increase for November, 1920, over 1915 is 288 per cent, and for the middle of 1921 is 174 per cent, as compared with 178 per cent in 1919.

These comparisons show that prices of raw materials on June 30 of this year are about on the same level as those referred to by the commission as reaching abnormal heights, while equipment prices were actually higher.

Cost of Money

About the same tendencies are noted in comparing the cost of money. The "bond index" of the *Wall Street Journal* includes ten utility bonds of which four are street railway bonds. Based on this index the average yield in 1918 for these utility bonds was 6.23 per cent. In January, 1920, the market price of these securities showed an increase in yield demand by investors to 7.17 per cent, or an increase of 15.2 per cent, and in August, 1920, the yield was 8.04 per cent. Since this low point the utility bond situation, as indicated by the index, has slightly improved, and in August, 1921, indicated a yield of 7.32 per cent, which is only 2 per cent above January, 1920, but still 17.5 per cent

*Abstract of a paper presented at the annual meeting of the American Electric Railway Association, Atlantic City, N. J., Oct. 3-6, 1921.

above January, 1918. If a separation be made between the street railway and other utility securities used in preparing the index of utility bond prices, it is noted that whatever improvement has been made has not been due to street railway securities. There has, accordingly, been no betterment in the cost of money; in fact, conditions as represented by an analysis of the market would indicate that the credit of the industry has until quite recently been at a lower ebb than when the commission made its report.

The Progress in Applying Remedies —Increased Fares

The principal recommendation of the commission was that emergency relief be provided through increase of fares. Such increases have been general and are still in process.

On Jan. 1, 1918, the highest rate of fare charged by street railways operating in cities of 25,000 population or over was 6 cents. Out of 300 operating systems, there were on that date twenty-five which were charging a 6-cent fare, five with zone systems of various kinds, and the balance, or 269, were operating with a fare of 5 cents or less. By Sept. 1, 1921, the number of 10-cent systems had increased to fifty-seven, the number of 9-cent systems to six, the number of 8-cent systems to thirty-six and the number of 7-cent systems to eighty, giving a total of 179 which were operating at fares greater than 6 cents as compared with 102 on Jan. 1, 1920, and none on Jan. 1, 1918. There were only forty-nine systems remaining out of the 300 which were operating at 5 cents as compared with 103 on Jan. 1, 1920, and 269 on Jan. 1, 1918.

The general tendency has apparently been to retain the existing flat fare system rather than to obtain relief by charges for transfers or by instituting a tariff based on distance traveled. The number of systems operating under a zone fare of any sort has only increased from five on Jan. 1, 1918, to fourteen on Sept. 1, 1921. This small net increase over the entire period is due in part to the fact that certain systems which at one time during the period were operating under zone fares of one sort or another have reverted to a flat fare.

An average street railway fare has been computed for all cities in the United States over 50,000, except New York City, weighted on the basis of population. On Jan. 1, 1918, this average was 4.92 cents per revenue passenger. At the same date in 1920 the average increased to 6.29 cents per passenger, and on Sept. 1, 1921, it had further increased to 7.25 cents per passenger.

These increases are so substantial that the question naturally arises as to why their effect has been so negligible upon the net income of the industry. One reason lies in the widespread depression of traffic; another in the sustained high levels of cost of operation, in which labor is so important an element. As of Sept. 1, 1921, wages show an average increase of 104 per cent since 1914; fares an average increase of 50 per cent.

Economies of Operation and Public Co-operation

The commission recommends that the industry put into effect such economies of operation as will enable it to give good service at the lowest cost. Among these it enumerates the elimination of deadheads and other free service, the abandonment of non-profitable lines, substitution of one-man cars, modification of special taxes for paving and snow removal, the reduction of rentals and power rates as may on investigation prove excessive, the co-operation of the public in developing faster schedules and installing skip stops at convenient places, rerouting, use of trail cars, keeping car tracks clear of traffic, and the regulation of vehicular traffic. Many of these economies are beyond the control of the management, and the commission admits that in some cases they entail legislation and the co-operation of public authorities.

A survey of what has been accomplished along these lines discloses generally a record of economy and efficiency by the industry, but the record of public co-operation is disappointing.

No appreciable progress has been made in the elimination of free transportation service, principally because this is a franchise requirement. The one notable exception is the step made by Seattle upon the acquisition of the railway lines to charge for policemen and firemen.

Abandonment of non-profitable lines has as a rule been limited to sections of track in districts served by adjacent lines of the same company or by other forms of transportation. The most extensive abandonments for this cause have occurred in Massachusetts under trustee control and in New York City under receivership. In fact, much municipal commission and court action has been to restrain action on abandonment of non-paying lines on the general grounds that convenience and necessity of the public knows no economic law.

The use of one-man or safety cars has very largely increased. In some instances—as in Terre Haute—entire systems are now one-man operated. In the majority of cases, however, one-man cars of either the standard single-truck type or of larger types are being operated on lighter traffic lines to permit the furnishing of more frequent service at a lesser cost.

Of forty large companies where the skip stop was in use during the war, only sixteen companies still use it in regular service. In most cases it was adopted as an emergency measure to save fuel, and the selfish interests of the few people inconvenienced have in many cases convinced regulatory bodies that the need for such economy no longer existed, to the detriment of service and comfort of the large number of long-distance riders. Where the skip-stop scheme was installed after thorough study, and has been properly administered, it is in many cases still in effect.

The relief afforded to the industry as a whole by modifications of or relief from special taxes, paving obligations, sprinkling, etc., has been so meager as to be almost negligible. The association reports six companies which have been relieved of paving obligations under existing franchises. All of these are small companies, and in some of the cases the relief is not permitted, or is contingent upon special conditions. Out of twelve active or proposed service-at-cost franchises, only four make any concessions to the operating company relative to paving or sprinkling requirements. The most extensive and important remedial action is that recently taken by the Connecticut Legislature, whose action is a long step in the right direction, although it still leaves some things to be desired.

The problem of achieving operating economies and improving service by rerouting has perhaps received more attention than some of the other means suggested. Kansas City, Akron, Indianapolis, San Francisco and Milwaukee are among those cities where extensive changes in car routings have been made, and numerous other cities are working out the same problem.

Some advances have been made toward the extension of trailer operation. Chicago has recently joined the list of seventeen companies which were operating trailers in 1920 and prior years. Companies using trailers have generally appreciated their value in the economical handling of rush-hour crowds and have continued to increase the number in use.

The traffic regulation in large cities is gradually improving, and in many cases police departments are beginning to appreciate the advantages and importance of keeping street car tracks free from congestion. The general tendency has been to increase the restrictions on automobile parking in the downtown areas, and many cities now prohibit such parking on main thoroughfares. Chicago and Pittsburgh are recent examples of earnest efforts to speed up traffic in the congested districts.

As for the earnest suggestion of the commission that extensions should be paid for by assessments on outlying property benefited, no single instance is yet on record where this advice has been followed.

Motor Competition

The commission expressed some concern for and recommended efficient regulation of jitney and motor bus competition.

Data before the commission showed a registration of 6,100,000 motor vehicles in the United States on Dec. 31, 1918. At the end of 1920 the registration shows an increase to 9,200,000 motor vehicles. The figures indicate a situation about 50 per cent more serious from a competitive standpoint than that to which the commission referred.

Such state regulatory measures as have been passed during the past, notably in New Jersey and Connecticut, do not seem to be working satisfactorily in practice. Proposed legislation in other states, notably California and Wisconsin, to regulate the business has failed of passage. Even in "service-at-cost" cities, like Toledo and Youngstown, jitney competition has been pronounced. In Kansas City a compromise was reached in March of this year by an ordinance which still permits jitneys to run on streets not occupied by car tracks. Jitneys were ruled off the streets of Seattle by the municipal railway over a year ago, but are reported as still operating.

While the motor bus has the advantage of low investment and small overhead expense, and greater speed and flexibility of operation, the operating cost of a motor bus per seat-mile is practically twice that of an electric car. It is not likely, therefore, seriously to menace the industry except during periods of unemployment. Where railways have been forced to wear the jitney out by competition, a scheme of fares which makes patrons regular customers, such as the dollar pass, and frequent service with one-man cars have been effective weapons. Many companies have met the problem by the operation of motor buses in effecting extensions of existing routes and in creating entirely new routes. The motor bus operated as a supplement to the railway service, or the trackless trolley with its combination of economy of operation and low investment cost, may yet be the method of relieving the electric railway from finding large amounts of new capital each year to finance extensions which will not be self-sustaining for some time.

Differential Fares

The commission finds that the failure of the electric railways to vary flat rates of fare for transportation service based on the length of the ride is "one of the contributing factors to their present financial condition." It points out that the industry is the only public utility which has consistently adhered to a flat rate fare basis, but believes that the introduction of a zone system of fares is a matter which should be decided by the community itself because of the social problems involved.

The two major experiments with the zone type of differential fare which has been made in this country during the last four years are those of the Public Service Railway of New Jersey and of the Connecticut Company.

In spite of the failure of these two large companies successfully to institute and operate a differential fare, other smaller properties have met with better success. The San Diego Electric Railway of California installed on Jan. 1, 1920, a differential fare made up of two 5-cent zones with important ticket concessions. The result was that traffic increased and the company has been satisfied that it is getting the maximum revenue which any system of fares would produce, and this is being done with no attendant difficulties in fare collection. In Massachusetts the cities of Holyoke and Springfield have been operating with a differential fare for approximately three years. In Boston the flat fare is 10 cents, but the company has recently instituted 5-cent local fares in several of the outlying communities. The results of this experiment seem to indicate that the increase in local riding has justified the fare concession.

In Milwaukee the differential fare which has been in effect since 1914 is still operative with only minor modifications. The necessary revenue increase which the company needed, however, has been obtained by an increase in the flat fare charge in the central area rather than by retaining a low flat fare and increasing the number of zone fares in the outlying districts. New experiments in the way of differential fares have been tried in Racine and Kenosha, Wis., and in Racine and Iowa. In the first two of these cities an unlimited ride pass is sold for $1, which is good for transportation for one week. In Mason City it is possible to purchase a monthly ticket which entitles the holder to ride for 5 cents per trip instead of the regular fare of 10 cents.

With the return of normal traffic and decreasing costs, it seems certain that increased flat rate fare will tide the industry back to normal. High fares, however, will not stimulate the confidence of investors and some form of differential fare may be the means of meeting competition and improving revenues.

Experience with Service-at-Cost Plans

The commission, to quote direct, "strongly recommends the principles of the service-at-cost contract not as the only solution but as one means of solving a very difficult problem." The survey of recent experience with service-at-cost plans discloses somewhat disappointing results. This is particularly true of those plans which incorporate a fixed fare policy with automatic variation in unit fares and a fixed upper limit.

Cleveland reached its maximum rate of fare under its service-at-cost plan of 6 cents cash, nine tickets for 50 cents and 1 cent for transfers, on Nov. 14, 1920. Despite a reduction of 10 per cent in wages of all officers and employees, except trainmen, on Feb. 1, 1921, and 20 per cent in trainmen's wages on May 1, the $500,000 interest fund by July, 1921, has dwindled to $139 000, less than nothing, and, due to insufficient operating allowances, maintenance and renewal reserve accounts disclose in addition a deficit of over $500,000. It is reported that service has been considerably curtailed, a five-day week has been established for shopmen, all but most vital maintenance work has been postponed, and further wage cuts are contemplated. Finally, because the company was unable to secure new capital under the restrictions imposed by the ordinance, the directors have authorized the officers to take the funds for all expenditures for new work from the maintenance allowance.

Cincinnati reached its maximum rate of fare of 9 cents cash and 8½-cent tickets on July 1, 1920. The increases have been made in ½-cent stages in accordance with the service-at-cost plan. A straight 9-cent fare contemplated on March 1, 1921, was enjoined by the city. Meanwhile the result of ensuing litigation has been a revision in the original contract whereby the company is temporarily relieved from the payment of the franchise tax and the accrual of certain reserves, in return for which fares have been reduced to 8 cents. The company's report for 1920 shows a deficit over the cost of operation of $665,000, and the total accrued deficit to April 30, 1921, was reported at over $806,000.

The Dallas service-at-cost agreement is based on a 7 per cent return on the agreed valuation of the property. Its 5-cent fare continued from the time the contract went into effect in 1917 until June 17, 1920, when the fare was increased to 6 cents. By Dec. 31, 1920, the deficit in the stipulated return on capital allowed by the ordinance was reported at $651,000. Application for a 7-cent fare was denied by the city on May 2, 1921. The company filed with the city commission a request to continue the 6-cent fare, this rate automatically expiring by limitation after one year's operation.

Under the service-at-cost franchise of the Montreal Tramways, 6 per cent was allowed on capital, 7 per cent on additions to capital and 6 per cent interest on working capital. At the end of the first year's operation, June 30, 1919, the receipts failed to meet cost of service by over a million dollars. By the end of the following fiscal year, June 30, 1920, the cumulative deficit had increased to $1,700,000, and by the fiscal year ended June 30, 1921, the cumulative deficit amounted to about $2,000,000, including payments due the city. In these years the company has been unable to make the annual half-million dollar payment to the city of Montreal for the use of streets as defined in the contract. The standard fare of 6 cents was raised in August, 1919, to 7 cents cash, four tickets for 25 cents and special tickets to workmen of five for 25 cents.

In Rochester a service-at-cost plan became effective in August, 1920, with a 7-cent fare. It has been necessary to draw upon a $300,000 balancing fund. By October 30, 1920, a cumulative deficit is reported in this fund of $106,000. No further figures have been issued.

In Toledo the community traction plan was inaugurated in February, 1921. The plan began with a cut in fare from 7 cents to 6 cents and transfer charges from 2 cents to 1 cent, with tickets of eight for 50 cents. In August of this year the ticket rate was increased to six for 40 cents, with no change in the cash rate. The stabilizing fund was reported in September as

standing at $140,000, instead of $300,000. It must rise to $500,000 before a reduction in fares is possible. The published estimate in February indicated that the jitneys were taking at the rate of $425,000 a year in revenues from the company.

The report comes from Memphis, which is enjoying both service under a service-at-cost arrangement and a receivership, that deficits have been incurred of $200,000 by July 31, 1921. In August the company announced the discontinuance of ten tickets for 65 cents in favor of a straight 7-cent fare, with the prospect of an 8-cent cash and ten tickets for 70 cents rate if the drop in riding did not stop.

The Massachusetts service-at-cost plans appear to be operating more satisfactorily. Because of the strict and early regulation of securities, overcapitalization has not been possible. Nevertheless, the electric railways of that state appear to have been in no better position than those in other states of the Union. Of the thirty electric railways only five have earned and paid dividends in cash on their capital stock of at least 5 per cent each year for five consecutive preceding years without impairment of assets. In prewar years there have been as many as two dozen companies which have done this. It is significant that out of the five survivors, three are companies whose dividends are guaranteed by leasing companies.

Massachusetts street railways can be aided by contributions from public funds to an amount not exceeding $1 per $1,000 of assessed valuation in towns and 50 cents per $1,000 of assessed valuation in cities. The Massachusetts Department of Public Utilities in its report of April 1, 1921, points out that the amounts which can be so contributed under the statute are "so small a sum as to make the whole method practically valueless." It recommends that this "limit should be increased so that communities may be freer to contribute larger amounts for this purpose." The report shows that no action has been taken by the state along the lines recommended of remitting paving taxes. It shows for the 371 miles of track discontinued in the five years preceding April 1, 1921, that "nearly all of these lines served the convenience of their localities and helped in their growth and development." Auto bus transportation which has been substituted is reported as working well in some places and poorly in others.

The Massachusetts commission has apparently made a sincere effort to reach a solution of the traction problem. It is evident that it has not been possible under existing conditions to place its street railways upon a self-supporting basis, regardless of the rate of fare.

The two largest systems in the state, the Boston Elevated Railway and the Eastern Massachusetts Street Railway, are operating under special service-at-cost arrangements. The freedom of action allowed the trustees in fixing fares and levying upon the tax fund has permitted the uninterrupted working out of a five-year program of reconstruction. Important operating economies which would not have been possible except under public control have been inaugurated, and a trial has been made with the differential fare to encourage short-haul riding and the right secured to operate motor buses.

The Eastern Massachusetts Street Railway has also been under the control of a board of trustees since June 1, 1920. These trustees are also empowered to charge any rate of fare that will bring the maximum revenue necessary within each district, but they lack the Boston Elevated trustees' power of arbitrary pro rata assessment. The trustees have created sixteen operating districts, in each of which the cash fare was placed at 10 cents. Regular riders, however, were able to avail themselves of punch tickets at rates ranging from 6¼ to 8⅓ cents per ride. As a number of the operating districts failed to meet the cost of service, including 6 per cent on the valuation established by the Public Service Commission on the property operated, they have been given the alternative of contributing from taxation or losing the service. Two towns, Gloucester and Hull, which refused to make such contributions, have had service discontinued. Service has also been withdrawn from three additional towns, Woburn, Burlington and Billerica, for failure to curb jitney competition. Reports of the trustees show that for the six months ended June 30, 1921, the cost of service was earned by a slight margin, whereas there was a shortage to achieve the cost of service for the corresponding period in 1920 by $1,368,000. One-man cars are now reported as handling more than 80 per cent of the traffic. Non-paying lines have been ruthlessly abandoned, service on 123 miles of track having been discontinued.

It is apparent that the Massachusetts service-at-cost plan, with its greater flexibility, freedom of action to promote economies and power to compel co-operation by the municipalities served, has made further progress in solving the traction problem than other contractual arrangements.

Municipal Ownership

The commission does not recommend public ownership. It finds "that there has not been sufficient experience with public ownership and operation in this country to recommend it as a permanent solution." It points out, however, that the experiments being made in this direction will be watched with interest. This discussion would not be complete without a brief review of the more important changes in the municipal ownership field.

The Municipal Railway of San Francisco operates 68 miles of line selected with respect to greatest tributary traffic density. The fare has remained at 5 cents. Published reports show a deficit of $137,000 at the close of the fiscal year ended June 30, 1920, and the advance report for the fiscal year ended June 30, 1921, announces increases of over 6 per cent in operating revenues as against only 3 per cent in operating expenses, leaving net earnings which are declared to be more than sufficient to meet all overhead charges.

The Seattle Municipal Railway, according to the report for the first seven months of operation ended October 31, 1919, disclosed a profit, but according to the comptroller's analysis of the operations for the year 1919, there was a net loss of $517,000. In June, 1920, the fare was raised from 5 cents to 7 cents cash, with fifteen tickets for a dollar. In July of the same year the cash fare went to 10 cents, with tickets at the rate of four for 25 cents. As the increased revenue still fell short of meeting expenses, the ticket rate was increased to 8⅓ cents on Jan. 8, 1921. A great hindrance to the successful operation of the municipal lines has been the continuance of severe jitney competition, which became particularly noticable after the last increase in rates.

The creation of the Detroit Municipal Railway followed rejection by the people of that city of the purchase of Detroit United Railway and the voting of $15,000,000 of funds for construction and operation of a supplementary system. The city built 18 miles of track in 1920 and is reported to have under completion 83 miles in 1921. Negotiations have been opened for the purchase of tracks of the Detroit United Railways on which franchise rights have expired. Significant features of the Detroit situation are the operation of one-man cars and the impending purchase by the city of trackless trolley buses.

Late in 1920 the city of New York found it necessary to continue operation of the Staten Island Midland Railway, which had suspended for lack of funds. By arrangement with the receiver the city undertook to furnish seventy-one safety cars and to operate the property through its Department of Plant and Structures, and to share any net revenue with the owners of the railway. The report for the first seven months ended June 30, 1921, shows a final net balance after taxes and depreciation of $4,000 on total revenues of $25,000. The fare charged is 5 cents.

The city of Toronto on Sept. 1, 1921, took over the operation of the line of the Toronto Railway and merged these with the Toronto Civic Lines. The Toronto Railway served only the territory within the old municipal limits, so that the passengers from the Civic Lines in the suburban territory paid a second fare on a second car of 5 cents cash in the city and six tickets for 10 cents on a short suburban route. The Transportation Commission has announced that instead of a universal 5-cent fare the rate will be 7 cents cash for adults, or four tickets for 25 cents. It is significant that the jitneys were ordered off the streets at once.

Public ownership has become less popular only because more people think

that it is likely to prove a losing venture. The early advocates of this principle have ceased to talk about profits and now openly advocate low fares with deficits supported by taxation. The opportunities under municipal ownership for lightening burdens to which the industry is still subjected are so substantial that it is entirely possible that the solution of the traction problem may be found along this line.

Conclusion

A review of the comparative position of the traction industry four years ago and today discloses that it has in the intervening period passed through the most critical period in its history. The financial condition actually became worse than pictured by the Federal Electric Railways Commission. Some of the solutions of the problems confronting the industry recommended by the commission have been availed of and produced results; others have not received appreciable recognition by public authorities and accordingly have been inoperative.

The difficulties confronting the industry are as acute today as they were at the beginning of the four-year period. We have made some progress in learning that some hoped-for solutions have proved ineffective.

Abnormal Costs Still Prevail

Recent months show some turn to better conditions. Perhaps it is because the turn has been so recent that there is yet so little indication of readjustment and satisfactory settlement. Unlike other industries, the street railway is still confronted with the abnormal costs which have been the aftermath of the war. But the problem of readjustment seems to be much bigger than the mere forcing of operating costs back to normal; the restoration of 1913 conditions of traffic, revenue and expenses would not produce a buoyant industry. A great deal of useful work of ultimate benefit to the industry has been done during the last four years, but it can be regarded only as preliminary to the final readjustments that must come if the business is to enjoy prosperity.

The Interest of the Manufacturer in the Electric Railway Industry*

Transportation Is Necessary to Manufacturers as Well as to Community Welfare—Various Ways in Which They Can Help the Railways Are Outlined

By E. F. Wickwire
Sales Manager Ohio Brass Company

IT HAS been said that a crisis must always be reached before a revolution can take place. It is not impossible that we are on the verge of a revolution in the electric railway industry.

And no doubt we will welcome it, if it can be brought about through the application of new ideas to existing facilities and the utilization of new methods to improve the present situation—all inspired by the conditions which have brought forcibly to us the realization of their need. Perhaps after all this is our opportunity, to which we must rise in order to advance. Nothing can stand still and progress—not even a trolley car.

The present difficulties of the electric railway industry are too well known to you to warrant my taking up time attempting to enumerate all of them. But, generally speaking, what is there back of most of these things that permits them to exist? Isn't it pretty largely a matter of public opinion, or, in other words, the average man's mental attitude toward the traction company?

Could many politicians and a certain class of newspapers continue to use the street railway as a football if the public generally understood the real motives back of their efforts—that the politician is simply after a job and the newspapers referred to are stirring up agitation for the sole purpose of promoting their circulation and not at all because of their love for the "dear people" whom they are fooling? Some one has said that "in our country most of our troubles are produced by those who do not produce much of anything else." People of that class, of course, do not want the street railway question settled. And perhaps we cannot hope for much from the fellow who likes to argue and will not listen to reason. You know some men like an argument so well that they will not even "eat anything that agrees with them."

A Concerted Effort Is Necessary

In other words, the problem resolves itself largely into a matter of education. And if we manufacturers and railway men do not make a concerted effort and carry on a vigorous campaign to educate the public and convince them of the fairness of our proposition, then who is going to make such an effort along the right lines? And if you do not realize just how difficult this matter of educating the public is, if you do not appreciate how unsophisticated some people really are, just keep your eyes and ears open all around you in your own home town and you will soon begin to realize it.

Transportation Necessary to Manufacturers

We in the manufacturing business are keenly alive to the fact that electric transportation in, around and between cities is vital to the development and progress of any community. We know the value and importance of locating our plants adjacent to such transportation. A city otherwise desirable is comparatively unacceptable if workmen employed in the plant are deprived of trolley facilities for readily reaching their homes after the workday. And if every city were so interlaced with trolley service as to make shopping more accessible, I cannot but feel that trading would flow more evenly instead of intermittently.

One of the most forceful illustrations of the effect of lack of trolley transportation upon a community happened not long ago in a well known city in Ohio, where, after a long drawn out fight between the city officials and the railway company, the property was abandoned and the rails torn up. A short time afterward the town endeavored to induce an important manufacturing industry to locate there. The town was well situated, possessed good steam railroad facilities and many other advantages. But when the representatives of the industry referred to found that the town had no street car service, they refused absolutely to further consider the question of locating there and went to a neighboring town where the street car service was good.

Traction Service a Big Asset

This is a significant indication that the mere fact of having street car service is a big asset to a community, to say nothing of the real benefits derived from the service. In other words, a town that has no electric railway service presents the appearance of a deserted village, and no amount of jitney buses can overcome that handicap. In the town I have referred to, if all the jitney buses in the State of Ohio had been assembled in that town, it would have failed to satisfy officials of the new industry that the trolley was not needed. Nothing has been developed that will adequately take the place of the trolley car, and the sooner people wake up to that fact the better it will be for the country and for all of us.

Some people who are in the habit of getting around in their own motor cars perhaps don't fully appreciate how useful the trolley car really is—unless perchance they become identified with a suburban real estate development, when they very quickly begin to realize what a fine old substantial asset a good electric railway system really is to a community, and how much it will add to the value of their property. Every live real estate man will tell you that

*Abstract of paper presented at meeting of American Electric Railway Association, Atlantic City, N. J., Oct. 3-6, 1921.

if he can point to established electric railway service to his allotment, it is the very best selling argument that he has.

Employees Can Be Educated

We can tackle this matter of educating the public in many ways, but to begin with, we can educate our own employees. I will venture to say that the large majority of employees (and I do not mean factory workmen alone) connected with industries whose welfare is largely dependent upon the prosperity of the traction companies and other public utilities have not the right mental attitude toward those public utilities from the public service standpoint. And these employees perhaps form a more influential part of the general public than we have realized. And most of them do not even connect the unjust criticisms that they hear and read against the traction companies with the fact that these criticisms are directed against the very industry upon which they are actually dependent for a livelihood. If we can awaken them to that fact alone, we will have accomplished a great deal in this campaign of public education. And I believe that we can go still further in that direction and educate our employees to a point where they will have a pretty fair general knowledge of the real electric railway situation, so that when they mingle with their friends and the general public they will take the trouble to defend the industry of which they are a part and perhaps even fight for a square deal for the electric railway.

We manufacturers can carry on this work in various ways. For instance, our company is running a series of educational articles in a little monthly publication that we distribute to all of our employees. We, of course, try to word these articles in simple, direct language that will be understood by the average workman in the factory, and we use some illustrations whenever possible to make the article look more attractive and to emphasize some point more clearly. We find that the employees usually take these little monthly publications home, which is also a good thing, as you will appreciate—especially where they have large families who read them.

A Slogan Might Help

We also supplement the printed articles by giving some short educational talks to the men at some of our factory employee association meetings. And we are even considering the advisability of using some attractive printed slogan or pointed comment on our pay envelopes. For instance, we might say:

> When the Trolley Cars Stop
> Our Pay Takes a Drop.
> When the Trolley Cars Run,
> Ain't We Got Fun.

Not dignified perhaps, but we are after results, not dignity.

Now is an exceptionally opportune time for the manufacturer to carry on this educational work with employees. There are very few workers who have jobs who cannot see general conditions around them and in turn appreciate more than ever what their own job really means to them. For instance, I recently heard of a case in one plant where a worker who a year ago was showing signs of radical tendencies, upon leaving the factory after a short day's run, met a factory staff member and asked him to tell the sales force to "get busy and get some more orders," because he and his family needed the money resulting from a full day's work. This fellow's mind right now is probably most receptive to the kind of educational work I have outlined, and you may be sure that in his predicament, if once awakened to the needs of the industry, he would lose no opportunity to carry the word along.

Again, what proportion of our employees riding by trolley each morning and home again each evening fully realize what the traction service really means to them, their work and their families. Perhaps a few do, but many take it as a matter of course, and here again we can teach our workers to "fight for the cause" if we educate them to look upon the traction companies as real benefactors.

Getting Back at the Councilman

There are many other ways in which the manufacturer can promote this work. For instance, a factory manager recently attended a Council meeting where one of the Councilmen—a merchant—started a tirade of abuse against the local traction company. The factory manager interrupted, asking, "What plants are running to any extent in this town? The match factory?" "No." "The rubber works?" "No." "The chemical plant?" "No." "Then what plants are running fairly well?" asked the factory manager. "Well," said the Councilman, "your plant seems to be running much better than the others." Then, said the factory manager, "Do you realize that we are running on business secured from public utilities, including the electric railways, and you, as a merchant, are getting the benefit through the trade that you secure from our employees? Then why assume such an unfair attitude toward an industry that is contributing largely to the business you have in your store?" And the merchant-Councilman modified his attitude when he found he had to reckon with the employees of the busiest factory in town, instead of playing the popular old game of knocking the railway. Although small in scope, this incident illustrates one of the many ways that we in the manufacturing business can use to further this educational work.

Another means by which the manufacturer can help this work along is by getting articles of an educational nature into the newspapers. Oftentimes a manufacturer can get a newspaper to publish such an article when it would be impossible for an electric railway company to do so. We have had articles of that nature sent to us, which we have been able to dress up with local color and have published in our newspapers.

Then, again, we manufacturers belong to Rotary and Kiwanis clubs, chambers of commerce, manufacturers' clubs, etc., in which we can very easily accomplish a great deal in getting people thinking along more liberal lines on this electric railway problem. Many of us also manufacture materials that are sold to other classes of trade than public utilities and we can spread the gospel in that direction in various ways, not forgetting to sow a little seed with those from whom we buy raw materials.

Another important phase of this subject that I would like to touch upon before closing is the fact that we manufacturers who are largely interested in making materials for electric railways and other public utilities have quite an army of employees that can be rallied to the support of the industry in legislative matters, if properly organized and directed. So far as my observations have gone, I do not believe that this association has really made a well-directed effort to enlist the support of the army of workers, and I am sure that they can be used by us as a strong influence in behalf of the industry in State and national legislative matters and perhaps even in municipal affairs.

I believe that this association has, in the field that I have outlined, a magnificent opportunity to enlarge the scope of its work and take more active steps in the direction of getting the tremendous advantage of the full strength and support of these workers back of our efforts to obtain a square deal for the electric railway industry. Our association might even exchange ammunition with the National Electric Light Association, or possibly combine forces with it in this work wherever we have interests in common.

Let's Have Unified Transportation

In closing, I would like to emphasize the fact that I believe we have arrived at that period when there must be more proper and more drastic regulation of the use of public thoroughfares for public transportation. In other words, jitney buses which come and go, and other means of hauling people which are competitors of the regular and the responsible systems, all tend to the depreciation of public service rather than to its betterment, and so I cannot but feel that the time has arrived when municipal administrations must be made to appreciate that one franchise, properly safeguarded for the public interest, must be granted, and confined to a single transportation company, which would furnish all transportation service which could be used to advantage in the community that it serves. Under this plan the transportation company can invest its money, earn a sufficient revenue to justify the investment and give the public the service that it must have.

Street Railways as an Investment*

Future for Urban Railways Assured as a Utility, but Pleasure Traffic Is Dead—Reduced Rate Tickets Are Useful—Rule for Prodigal's Return Home Is Given

By Roger W. Babson and Olin W. Hill

THE future of the street railway depends on its treatment from the proper standpoint—that of the public utility. It has ceased to be the public's plaything. Most of our street railway troubles come from the old idea that its principal reason for existence was to satisfy the—financial, political and literal—"joy rider."

In the readjustment of the last few years the street railway has but followed the history of all our other modes of transportation—the horse-drawn buggy, the roller skate, the bicycle, the automobile, and the jitney. Each in turn has had its day as a fad, followed by a reaction. Then, in the case of those for which a practical need had been found, there developed a substantial, steadily growing demand along staple lines, without any spectacular features. The readjustment has meant necessarily the elimination of large amounts of capital employed to satisfy a temporary and freakish demand.

The electric railway systems of this country comprise an industry involving over $5,000,000,000 capital with a gross business in excess of $1,000,000,000 a year. It falls within the group of less than a score of industries exceeding $1,000,000,000 gross and, by a curious coincidence, ranks next in size to another transportation industry, the boot and shoe business. In respect to percentage of gross income expended in pay rolls for labor—about 46 cents out of every dollar taken in—it outranks practically every other industry except watch making and the steam railroads. When we come to look at the net earnings, however, this great industry comes far down in the list, saving slightly less than 2 per cent of its gross for net. It has not the advantage, inherent to man industries, of a rapid turnover of its capital. There are comparatively few manufacturing concerns that can get along on a lower basis than gross turnover annually equal to the total capital devoted to the enterprise.

The street railways, with $5,000,000,000 capital and gross revenue of $1,000,000,000, are getting their money back at the rate of only once in five years. In the case of Boston Elevated, where the issue of securities has been so carefully supervised that no question of water in the capital has ever been raised, with a total funded debt direct or guaranteed of $44,000,000 and capital stock direct or guaranteed of $46,000,000 additional, making a total capital account in excess of $90,000,000, this system shows gross earnings, even with a 10-cent fare, of but little over $33,000,000 a year.

ROGER W. BABSON

In passing, take notice what the significance of this is as to the necessary charge-off for depreciation. If your plant, new, is reckoned good for thirty years, depreciation alone must eat up 15 per cent of gross earnings on the average, and 9 per cent to 10 per cent even in the case of Boston Elevated. How much of your plant is good for thirty years—and how many systems have made any such allowance for depreciation?

In analyzing an industry, two factors that must be borne in mind are, the fixed investment represented in plant for a given capacity of product, and the absolute limit at which price becomes prohibitive to the consumer. With the high plant cost to which this industry is subject, and the narrowly limited unit price for its product, we come then to the conclusion that only by the fullest and most constant utilization of plant can success be attained. This constant and full utilization is to be found in our large centers of population. There is no question about full traffic on almost any of the city lines.

We are led, then, to our first conclusion. The future of the street railway is found in the urban road; particularly, those lines which have some element of rapid transit combined and which, either by original supervision or through the fires of reorganization, have a fair capitalization. For the lines operating in congested centers the private automobile has little competition to offer. As a matter of fact, the greater the number of automobiles, the more indispensable is the city railway with its elevated or subway connections for convenience of getting about. We may run about the suburbs and small towns as we do with our automobiles, but when we are going in town we often park our car at the outskirts and complete the trip by street car—or else take a subway or elevated.

Our second conclusion is that the pleasure business of the street railway industry is dead. Whereas formerly the suburban lines catered to pleasure travel and looked for the biggest business on Sundays, the condition now is that Sunday travel is the smallest. There has been a large waste in the establishment of outlying pleasure parks and summer resorts as a street railway enterprise which may as well be regarded now as money thrown away. As far back as 1917 the total gross income of all the street railways of the country amounted to exactly 5¾ cents per revenue passenger carried. Clearly the average rider is the short haul urban passenger, not the long haul pleasure tourist out into the country.

The jitney will never kill the street railways. But the operating expense account can, and will, unless it is carefully watched and studied. Gross earnings of the total street railway mileage of the country have in no single year shown a decrease, going back to 1904 and coming down through 1920. This fact may surprise even some of you. Neither can it be shown that there is any trend to a decline in the total number of revenue passengers carried per year. Statistics on this point have become less satisfactory with the introduction of the zone system and the cash fare box. So far as the lack has been supplied by estimates, however, the consensus of opinion is that the street railway is still carrying between 11,000,000,000 and 12,000,000,000 revenue passengers annually

In other words, ten times the number of passengers are being carried on the street railways as are carried on the steam roads. There are fluctuations in traffic, of course, following very closely the general prosperity or depression. There is a general tendency for the habit of car riding to increase. This is striking in the case of New York City, where the revenue rides represented 304 trips per capita in 1909, 370 in 1919 and 421 per capita in 1920. In Boston, on the contrary, the fare increase has diminished the habit. Taking the population of the city proper as a basis—which, of course, is not exact—revenue passengers represented 545 rides per capita at the peak of traffic in 1917 and only 430 rides per capita in 1920.

It is the net earnings line that has shown a constant tendency to decrease from about 1912 until well into 1920. The operating ratio of the street railway industry was 57.5 per cent in 1902, according to the census. The latest available figures for comparison indicate an operating ratio very close to 77 per cent.

In our study of fares, we find them ranging all the way from a maximum of 10 cents, the standard on Boston

*Abstract of paper presented at the annual convention of the American Electric Railway Association, Atlantic City, N. J., Oct. 3-6, 1921.

Elevated, to a minimum of 5 cents on the New York railways. A deal of experimenting is being done. It is recognized that there is a point beyond which fares cannot go without loss of revenue. Most roads have reached this maximum and some are voluntarily reducing. Not only do higher fares discourage travel but they encourage demoralizing jitney competition.

The solution lies in a cash fare of 8 or 10 cents, with the sale of tickets at greatly reduced rates. One of the divisions of the Eastern Massachusetts, granted a 10-cent fare, first sold twelve tickets for a dollar, then fifteen for a dollar, then seventeen for a dollar, and this month is giving eighteen for a dollar, which is almost back to the old 5-cent fare. The headquarters for this division is Lynn. The statistics of fare reduction there make an interesting study for one interested in street railway transportation. Remember that the cash fare is 10 cents in Lynn today, but the man who rides every day can buy eighteen tickets for a dollar. Moreover, the first of next month the company will issue similar tickets, nine for 50 cents, purely with the idea of encouraging riding. It will still try to sell the man one dollar's worth of tickets, but they will be on two cards, so that two members of the family can each have a card with the same amount of family money invested.

Apparently pleasure riding is about over. The development of parks, white cities and playgrounds has become wholly a thing of the past. Where Sunday used to be the great day of the week, it now, on most roads, is one of the poorest days. We prophesy that the time will come when certain divisions will operate no more than a night schedule on Sunday, if at all. All of this, however, has a favorable side. It shows that the business today is necessary to travel, and tends to put the street railway business in a place with lighting and water—public utilities. The only fly in the ointment is the auto bus. We believe that the street railway business can be carried on more cheaply than auto bus transportation. Certainly this applies to heavy traffic and rapid transit. That is to say, the efficiently operated urban lines have nothing to fear from the auto buses. When it comes to the suburban lines, the auto bus may have a distinct opportunity and we still feel —as we have in the past—that the wise street railway company will give bus service where it can be most economically given. Many street railways would be better off to-day if they had turned some of their carhouses into garages instead of stubbornly putting their heads into the sand and refusing to see the handwriting on the wall.

The street railway is an ideal "cash and carry" business. Its entire factory product is sold out every twenty-four hours—and accounted for "C. O. D.," or rather "Pay-as-you-enter." It has no heavy merchandise inventories to carry over in a declining market. It has no bad accounts to charge off. The very conditions that place a staggering load on industry—and cause the investor to be wary of industrial offerings—will add to a continuing reduction of its operating costs and should make for increased operating efficiency. Its labor, where placed in full and true knowledge of operating conditions, has shown a disposition to be reasonable. Every new economy has proved itself and come to stay. On the lighter traveled routes, some almost miraculous results in turning costly "feeders" into revenue producing lines are, as yet, slightly appreciated. Fundamentally, conditions are right for attracting capital to the street railway as a medium of investment. The vital problem is to get right—and stay right—with the public.

The downfall of credit was due to neglect of the ethical factor. With the cheapness of electricity as compared with mule motive power, the idea was publicly accepted that you could carry "anybody, anywhere, any time for a nickel." Evidence of the spread of this is found in the repeated appearance before the Connecticut legislature of one Cowles with a bill to make a uniform 25-cent fare on steam railroads between intrastate points. The trolley promoter seized on this to sell the investor "capitalized hopes." When public regulation of capital was tried, as in Massachusetts, it was circumvented by the "holding company," or voluntary trust which could issue without limit.

The "construction company" graft was another method of fattening the promoters' pockets. Financing the entire cost by bond issues, sold to remote investors, with the resultant species of absentee landlordism and self-perpetuating management, was an attendant evil. Credit for these diluted issues was sustained by dividends paid out of maintenance. When the inevitable reorganization came the absentee bondholder was given securities based on "reproduction cost, new," for a property which was not new, but worn out. They capitalized not only "unexpired franchises" but city pavements, that belonged to the tax-payer and the constant repair of which was a liability.

When the remaining 90 per cent of the mileage is operated as efficiently as 10 per cent now is, street railway securities will come back to their own. Take, for instance, the use of the one-man car. In the case of the Eastern Massachusetts Street Railway system, which is now operating about 800 miles, 92 per cent of the cars are one-man cars; but hardly 5 per cent of the total street cars of the country are one-man cars. Street railway men who continue the two-men cars say that their situation is different from other situations and the one-man car is impossible. A close examination, however, shows that this is not the case. If the Eastern Massachusetts can operate 92 per cent as one-man cars, certainly the entire street railway system of the country can operate an average of 75 per cent instead of 5 per cent. The one-man car is not only a saving in labor but also a great saving in power and maintenance.

Great possibilities exist in connection with the revision of union rules on roads operated by union men. Such a revision is wholly possible if the men are approached in a proper way. The elimination of the seniority rule and the proper settlement of discipline cases adds greatly to efficiency and hence ultimately to income of the men and of the company. The wage paid is immaterial compared with the care taken by the men, their industry, honesty and desire to develop trade. Time is coming when every street railway company will have courses in salesmanship for their platform men. Many companies have done wonders in reducing operating expenses but there still are great opportunities in devising means of increasing traffic. The future of the business demands making every platform man a salesman. It may be feasible to pay platform men a commission on the business they do.

The old idea that track and equipment has a life of only ten or fifteen years is wrong. By the use of light cars, creosoting ties and poles and welding of joints this life is being extended for perhaps twenty-five or thirty years. We expect to see every street railway joint in this country welded. Yes, and we expect to live to see many other things done which we have for years been told were impossible.

Working under Chairman Loring of the board of trustees of the Eastern Massachusetts Street Railway Company is wonderful training for any man. He has done so many things and introduced so many economies which street railway experts claimed to be impossible that it has made us believe almost anything possible. As he says: "As we trustees had never been in the street railway business, we did not know enough not to try the 'impossible' things. As a result, we are spraying our cars with paint instead of using brushes, cleaning them with exhaust air instead of by hand work, and keeping accounts with but 20 per cent of the clerks we formerly had."

The right road for the street railway is the prodigal's road back home. As an investment, it is being, and will be, rehabilitated whenever and wherever it is operated as a local community enterprise for the public good—for service and not for promotion profits. It needs:

1. Service at cost—with the sliding scale of fares and, possibly, wages as related to dividends.
2. The local board of control with all books open to car rider and employee alike, showing the results of the local operating unit.
3. Customer ownership.
4. Increased stock equity.
5. Gradual amortization of debt—by reducing obligations at maturity, instead of refunding with an increase.
6. Willingness on the part of the management to do what the dyed-in-the-wool street railway expert has said is impossible.

Police Traffic Regulations of New York City*

Traffic Organization Outlined—Address Urges Standardization of Traffic Signs and Signals and Says Time Is Opportune for Co-operation in Highway Traffic Regulation

By John O'Brian
Inspector Traffic Division, Police Department, New York, N. Y.

OF ALL the varied problems confronting the civic authorities of congested centers the traffic problem is paramount. We meet it at every turn. It has become as inevitable as the tides, and with the natural growth and prosperity of the country it is ever increasing in volume and adding to its complexities.

It is of such importance that it affects directly taxation, real estate values, commercial enterprises and the welfare of the community. Its growth has been stupendous and efforts toward regulation and control have not been entirely effective, possibly because the problem has not received the attention and concerted action of the civic and commercial interests involved.

We all have our traffic problems back home and in many respects they are very similar. In the city of New York we also have our own traffic problems. They are not only unique in many respects but in volume are overwhelming.

Organization of Traffic Division

For the purpose of traffic regulation, there is in the Police Department a Traffic Division, which embraces the five city boroughs and includes all streets and highways, the East River bridges as well as Central and Prospect Parks.

The city is divided into precincts and subdivisions, each in command of a captain. At the present time there are 1,547 members of all ranks, including foot, mounted and motorcycle men, assigned to traffic duty.

The foot patrolmen are stationed at street intersections, bridge approaches, bridge roadways, ferries, pier entrances and in the vicinity of the railroad terminals and are used mostly to regulate and facilitate pedestrian traffic while in the roadway. Mounted patrolmen are used to regulate vehicular traffic at piers, and on streets or avenues where congestion exists in the middle of the block, thereby co-operating with the traffic foot patrolmen at the street intersections.

The motorcycle division is particularly effective in enforcing traffic regulations as to speed, lights, improper turns, signals, license plates, licensed operators and chauffeurs, etc. This squad, with a force of 114 patrolmen, during the year 1920 served 61,835 summonses for infractions of the regulations, and for these violations the offenders were fined $767,960. Of these summonses served, 16.94 per cent were upon operators of passenger vehicles, 26.98 per cent on commercial vehicles, 36.16 per cent on taxicabs, and 10.52 per cent on motorcycles.

During this period 294,137 motor vehicles of all kinds were registered in the metropolitan district, and I think the number of summonses served will indicate a fair percentage of activity.

In the city of New York there are more than 30,000 street intersections, but it is in the borough of Manhattan, which by reason of its layout, about 3 miles wide by 12 miles long, with its enormous permanent and transient population and its varied business interests, that the problem is most acute.

When it is considered that a single hour's delay in the movement of merchandise or of commodities essential to existence in every-day life results in an enormous financial loss and the inconvenience of thousands of citizens, the importance of traffic regulation is readily apparent.

During the past three years, the city has been most fortunate in having an administration which has taken a most active interest in traffic conditions. It has perfected and put into effect regulations which a few short years ago would have been considered too drastic to be contemplated. I refer particularly to the laying out of route streets; that is, setting aside certain streets exclusively for passenger vehicles and others exclusively for commercial vehicles. This regulation has greatly facilitated movement and given general satisfaction.

One-way streets where thoroughfares are parallel have also been found to be most effective in preventing congestion and minimizing fire hazards, though affording an unobstructed passage though these streets for fire apparatus.

Mechanical Means of Traffic Control

Another innovation in traffic control to which I invite your attention on your next visit to New York is the mechanical control of traffic now in operation on Fifth Avenue between Twenty-third and Sixtieth Streets. This system of lights and signals was devised and installed by Special Deputy Commissioner John A. Harris. It is so positive in control and so readily understood and observed by pedestrians and operators of vehicles that it frequently happens that its control is almost perfect in operation during the absence of patrolmen assigned to duty at the various crossings. If this system of control was extended to other crossings it would obviate in many instances the necessity of assigning a patrolman to so many street crossings.

As the traffic problem is a universal one, its control will only be effective by a standardization of regulations and signals. A step in this direction was taken during the month of May, 1921, at the National Police Conference, at which were representatives of police departments of 325 important nation-wide municipalities in forty-five states, convened in the city of New York. At this conference Richard E. Enright, Police Commissioner, New York, advocated that a national system of traffic control be worked out, that the co-operation of the states be solicited and that a uniform method of operation, speed and signals be agreed upon.

Traffic regulations to be effective must control. The control must be positive, and to permit any deviation, except in extreme emergencies, would be to nullify the regulation. Control is maintained by observance, admonition and penalties for infractions of the regulations.

When approaching a discussion of standardization of traffic regulation, it is well to keep in mind that what is wanted is to simplify and build up from a basic standard, so as to remove annoyance caused by a maze of regulations, often conflicting one with the other, with resultant confusion.

Standard Signs and Signals Essential

All signs, stanchions and lights should likewise be standardized as to design, color and use. Methods of signaling should be uniform. The great need today is a standard regulation that will make clear to a driver what is expected of him. If we can make it easier to do the right thing than the wrong, the final solution of the traffic problem will be at hand. In the large cities traffic problems are practically alike, and there is little doubt that a standard system could be formulated.

In any discussion of the subject of standardization careful consideration must be given to the commercial vehicle. This type of vehicle is ever increasing in size and weight and some restriction will eventually have to be placed upon its size and weight.

From 1915 to 1919, inclusive, the State of New York expended $21,062,066 for construction and $25,231,314 for maintenance of state roads outside of New York City. This outlay of money, while well spent, and accruing to the benefit of all citizens, cannot continue to increase at the present ratio without resultant tax burdens. The matter of permissible wheel loads should be standardized in all states. As for the matter of size of commercial vehicles, this is of more particular importance to city authorities where thoroughfares laid out long before the motor vehicle was dreamed of simply cannot accommodate the enormous motor truck without congestion, inconvenience to pedestrians and to business interests.

*Abstract of address presented at the annual convention of the American Electric Railway Transportation & Traffic Association, Atlantic City, N. J., Oct. 3-6, 1921.

The matter of safety is of first importance, and despite all the literature that has been printed and distributed and the warnings and devices that have been perfected to prevent accidents, the number of personal injuries and fatalities continues to increase year aftr year, until now it surpasses the fatalities occurring on the entire steam railroad service of the country. All blame, however, cannot be placed upon the vehicle operators. We cannot relieve the burden of caution from the pedestrian to exercise due care, and when the pedestrian is guilty of negligence accidents will occur, despite all precautionary measures taken by the operator. As to the reckless driver he can only be corrected by penalty, adequately and positively administered.

As children are most often involved in street accidents, they should receive first attention. Proper playgrounds and recreation centers must be provided for them. They must be taught the absolute necessity of caution when on the highways. They should be as familiar with the rules of the road and their own local traffic regulations as they are with the simple rules of hygiene which they are taught and so rapidly absorb. This task is not an impossible one and co-operation between departments of education, police departments and children's welfare organizations intelligently conducted will bring splendid results.

The time is now opportune for the better co-operation and co-ordination between the police departments of the various cities, the traction interests, the automobile interests and highway associations to bring about standardization of traffic rules and regulations. It is to such organizations as yours that police departments look to for co-operation and assistance in the solving of the various traffic problems as well as minimizing street accidents.

The results gained from experience by the Police Department of the City of New York is at the disposal of all interested persons. Advice will be freely given for the asking.

Correct Method of Purchasing Railway Supplies*

Definite Standards of Measurement by which Various Competing Articles Can Be Compared Will Simplify Purchase and Sale

By H. B. Doyle
Of Philip Kobbe Company, Inc., New York, N. Y.

THE electric railways buy enormous quantities of equipment each year. The salesmen of equipment and supply houses each year sell an equally large volume. From the salesman's point of view he has made a sale. From the point of view of the railway official he has made a purchase. Buying and selling are so closely linked together that it is often a problem whether the transaction has been a selling one or a buying one. All purchases of any kind are the result of comparing values and probably no two men compare values in the same manner, and no two salesmen offer their wares in the same manner.

Your committee has been good enough to ask me to talk on the subject of the K-V standards. These can be equally well called the K-V standards of selling, the K-V standards of buying, or the K-V standards of comparison, for their only purpose is to simplify a purchase or a sale by setting up a definite measuring block with which competing articles can be properly and fairly compared.

"K-V" is a name given to this method of buying and selling as a mark of identification. It is copyrighted by the company which I represent, and is only used by companies whose standards of comparison have been developed and worked out in conjunction with us. "K-V" is my company's guarantee that the standards are fair.

H. B. DOYLE

The care and exactness with which a comparison is made is in a direct ratio to the importance of the article under consideration and to the amount of money involved in its purchase. It is possible that in buying railway supplies and equipment, there is room for a more exact weighing of va'ues *before* specifications are written. In any given field there cannot be more than one article or item which is actually the best (assuming of course that the conditions under which it is used are identical or similar) and yet, those of you who are operating traction companies under similar conditions are undoubtedly buying a given kind of product from many manufacturers. That is what makes competition possible. But it is also true that not all of you can possibly be buying *the best.*

DUTY OF THE MANUFACTURER

It is clearly the duty of the leading manufacturer of any given line of equipment to help you purchase intelligently and correctly. Not only is it his duty but it is to his advantage. And modern selling is all along the line of actual service to the purchaser. I think it is clearly the duty of the man who has something to sell to analyze the factors that go into his article and to impartially evolve a method of purchase which can be presented to you for your approval (or disapproval) before the actual article is submitted. In other words, until the manufacturer, as the seller, and you, as the buyer, agree on a fair method of comparison, both you and the manufacturer are at a disadvantage. Neither of you has established a preliminary measuring block by which values can be justly compared.

For instance, take bearings. There are many makers of armature and axle bearings but it is inconceivable that all these bearings are of equal value. And yet all of them have some recognition on your various roads. If there *is* one best bearing for a given purpose, there also must be one best way of comparing bearings so that the one which is actually the best will be clearly revealed. When we analyze this we find that you are really buying the service that the bearing will render at a given cost. Therefore, some of the factors to be considered in a comparison are factors invisible to the naked eye and not subject to a physical test.

The finest bearing in the world at the cheapest price is of no value until it is delivered. And unless the manufacturer is substantial and responsible there is no guarantee that you will continue to receive your bearings promptly on delivery dates over a long period of time. Another point, or let us say another "standard," might be the location of the manufacturer. It is possible that a manufacturer of even a better bearing might not be the best one to deal with if his plant were located so far away that orders and shipments were unduly delayed.

The composition of a bearing varies not only according to the specifications of a road but also according to the skill and honesty of the maker. As you well know, an alloy may contain scrap metal and probably will contain hard and soft spots as well as some particles of iron which result in the scoring of the axle.

Another consideration is that of taper. Does either outside or inside diameter vary at either end more than six-thousandths of an inch? It is basic that bearings should not taper, and yet they do. The manufacturer and the railway buyer should determine and

*Abstract of address presented at the annual convention of the American Electric Railway Engineering Association, Atlantic City, N. J., Oct. 3-6, 1921.

agree upon a set of measurement standards which will take in not only the physical features of a bearing but all the other features which are represented by overhead and price. The argument which occurs between the salesman and the buyer should not be an argument on the merits of a given article but on the prime factors that enter into the article. When these factors are agreed upon, no competing manufacturer of merit need fear to have his product examined.

Several prominent railways have stated that they will give consideration to any equipment or supply house that is ready to discuss and agree upon a *set of standards* under which their product will be submitted and examined. We believe that any manufacturer offering his goods in such a manner should have consideration.

Make Your Safety Drive Continuous*

An Energetic and Systematic Public Safety Campaign Reduces Injuries, Increases Production by More Efficient Operation and Teaches the Great Value of Human Life

By Britton I. Budd

President Chicago, North Shore & Milwaukee Railroad

B. I. BUDD

IN INDUSTRY we find that a concentrated effort to reduce accidents keys up those concerned to the highest tension for the period and reduces the number of accidents materially. But does it pay? At the end of the drive the impressions gained wear off and we are again back in the old rut. If we can concentrate on safety for a short time and obtain results, why not make it a systematic and co-operative drive for 365 days in the year and obtain these results every week instead of for only one or two weeks of the year. It can be done; safety work in industry has proved it.

To educate the employee we find that we must first educate the employer, for in safety, as in other things, the attitude of the employee toward the work is dependent on the attitude of the employer. To accomplish this object the employer must show the employee that he is behind the safety movement heart and soul; that any recommendation that may be made by the employee tending to reduce or eliminate hazards and to establish safe working conditions is closely investigated and if found practicable is carried out. The employer must establish an efficient first aid system to care for employees who may become injured and must see that all injuries, no matter how slight, are given proper treatment immediately.

In an examination of the reports of the injured and killed we find that in 1920, out of 82,000 fatalities, 15,000 were children under fifteen years of age. What have we done to prevent the report for 1921 being a duplicate of that of 1920, or, in fact, what measures have we taken to prevent this list from being doubled this year? The number of autos on our streets has already increased 30 per cent over last year, and automobiles were the cause of a great number of these deaths. An energetic and systematic public safety campaign throughout the country is the only way we can accomplish our object. We must reach the public at home, on the streets and in business; in fact, the prevention of accidents must be brought home to the citizens of our country at every turn; they must not be allowed to forget it for an instant.

The establishment of safety instruction in our schools will give us a firm foundation which will not only bring results during the present generation but in the generations to come. The instruction of the children has begun on a small scale in many schools; in some it consists of periodical lectures and in others a half hour or an hour a day is being given over to this instruction. The older children have been given instruction in accident prevention at street crossings and in some cities have acted with the police department as traffic officers at the crossings during the hours that the children are going to and coming from school. In the instruction of children the effect of the word don't on the average ones results in their doing the very thing they have been warned against, while if they were told what they must do to accomplish a certain thing the result will be much more satisfactory.

The public safety work is in its infancy and to succeed must have the support of the management of the industrial plants who are experienced in safety work. It is just as much a part of their work in the upbuilding of the community to make it safe to walk the streets of their city as to make their shop or factory a safe place to work. With this support and with the chambers of commerce, clubs and civic organizations, police departments, boards of education, Boy Scouts and the general public, it is certain that we will make a material reduction in the list of preventable deaths and injuries.

Safety Organization in Chicago

The Chicago Safety Council operates as a department of the Chicago Association of Commerce, in conjunction with the National Safety Council. Its sole purpose is to make Chicago a safer city. Its activities are divided into four major divisions, known as public safety, industrial safety, railroads and public utilities and business administration.

The plan of the Public Safety Division, as shown in the progress report issued by the council, is as follows:

"1. On the committee composing the Public Safety Division are representatives of the homes, industries, churches, schools, women's clubs, civic bodies, city, county and state authorities, insurance companies, automobile clubs and all other organizations which have an interest either in the prevention of accidents or the education or prosecution of those who violate laws designed to safeguard vehicular traffic. This group of representative citizens, who have banded themselves together for the purpose of accident prevention, is already making its influence felt in an aroused public sentiment against the careless and many times inexcusable accidental deaths and injuries which occur altogether too frequently.

"2. Under this division there is a police and traffic committee, which is co-operating with the city and park police and the public generally in educating motorists in particular to have proper regard for enforcement of traffic laws and regulations. It is also developing plans for educating motorists in safe driving by means of bulletin boards installed at filling stations, garages, etc.; to conduct a school for chauffeurs and truck drivers, with a definite course of six lessons in safe driving, rules of the road, mechanical operation, etc., and to operate a school for women automobile drivers.

"3. The women, homes, churches, schools and colleges committee of the Public Safety Division has undertaken as its most constructive immediate function the matter of having safety instruction made a part of the curriculum in public schools and parochial schools.

"4. It also is preparing to carry on safety in the homes by means of distribution of illustrated bulletins describing the many home hazards. This subject is being presented to the women's organization of the city and it is contemplated that safety will be

*Abstract of paper contributed to the discussion of the report of the joint committee on safety work at the annual convention of the Transportation & Traffic and Claims Associations, Atlantic City, N. J., Oct 3-6, 1921.

given due consideration by the clergy in their sermons from time to time.

"5. Another arrangement about to be launched by the highway safety committee is one by which its reporting members will report to the safety council any dangerous practice or condition coming to their attention, including violation of laws and rules by motorists and others. These men will have neither insignia of any kind nor authority to stop or arrest violators, but reports made by them will be taken up with the offenders and an earnest appeal made for their assistance in the elimination of accidents. The plan provides for education and co-operation rather than prosecution, except that prosecution may be resorted to in extreme cases."

With the co-operation of the members of this association in a concentrated public safety campaign, along the lines of the National Safety Council's plan, the citizens of our great country will be brought to realize the value of human life and the necessity of exercising care and caution, which is a duty each and every individual owes to himself and to his fellow man.

Traffic Regulations and Safety Work*

Greater Responsibility Rests with the Driver of an Automobile than with the Pedestrian—Number of Persons Injured by Automobiles Appears Large, but It Is Very Small Considering Number of Machines

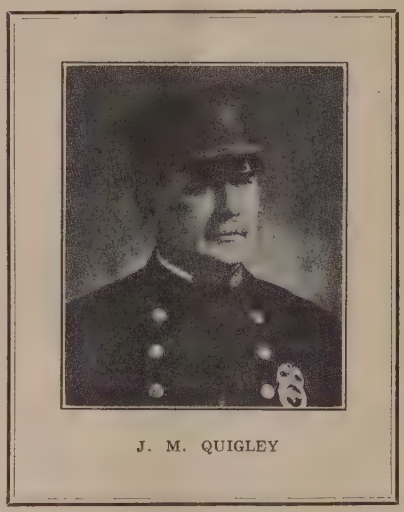
By J. M. Quigley
Chief of Police, Rochester, N. Y.

MY INFORMATION concerning automobile accidents has been gained from study of such occurrences which have happened on the streets of Rochester, N. Y., and whatever conclusions I have settled upon as to responsibility were reached after a careful and impartial study of the subject, with the object of finding out, if possible, a way to prevent accidents and make safe the streets of our city for all who may and have a right to travel them.

Webster defines an accident as that which happens without any known cause. According to that definition what proportion of automobile casualties can be classed as accidents. I will venture to say not more than 8 per cent. A careful investigation of such happenings invariably reveals a cause. An analysis of the cause of so-called accidents as revealed by the records kept in our office is as follows:

	Per Cent
Walking into side of, and running in front of automobiles	30
Reckless driving	10
Collisions	12
Crossing street not on crosswalk	8
Crossing street on crosswalk	6
Losing control of auto	5
Children playing in the street	3
Getting on and off street cars	3
Intoxicated persons	1⅞
Speeding	1
Collisions with street cars	2¼
Defective brakes	2

None of these come about accidentally. If the working of the mind of the operators involved could be known, it would be discovered that a forewarning had preceded the occurrence, but haste and recklessness challenged and they proceeded and took a chance, with the usual result.



J. M. QUIGLEY

Safety of person is more important than commerce or rapid transportation and it must not be subordinated to either. The operator of an automobile on the highway has equal rights with those traveling on foot but each must observe reasonable care for the other's safety, determined from the extent of danger incident to the use by each respectively.

Xenophon P. Huddy, in his work "The Law of the Automobile," writes interestingly and logically on the relative danger of persons traveling on foot and those traveling in vehicles on the highways, as follows: "The pedestrian class is the weakest of all others which use the public streets and thoroughfares. Those who travel in vehicles are protected to a more or less extent against actual personal contact with other objects on the public thoroughfares. Consequently there is advantage taken of the inequality of the situation. Naturally a pedestrian will flee in order to avoid injury, no matter whether he had at the time a legal right to hold his ground.

If the drivers of automobiles and other vehicles fully realized the seriousness of their conduct when the right of way of the pedestrian is not respected, and if the common law would be enforced, there would be a marked decrease in the accidents which happen on the public highways."

The driver of a vehicle, whether it is an automobile or a horse-drawn carriage, if he is guilty of inattention to his duty, may be criminally responsible for any death which his vehicle may cause at the time. For example, if he is driving an automobile while holding conversation with a companion and not looking ahead to see who may be on the highway. Under such circumstances, if he should kill a child, he would be guilty of manslaughter.

From these opinions the conclusion can be drawn that the greater responsibility is upon the driver of a vehicle. Reverting to the causes of accidents in which persons were injured or killed, it will be observed that the large number were said to have walked into the side of or in front of the automobile, making it appear that the pedestrian was negligent in every instance. A careful scrutiny of the reports of the investigators of these occurrences, however, compels us to attribute the cause to carelessness on the part of the driver of the automobile for the reason that, moving quietly as it does without the noise which accompanies the movement of a street car or a horse-drawn vehicle, the pedestrian is unaware of its approach. He steps into the street and is struck; not because the pedestrian was careless or incautious, but for the reason that the automobilist did not exercise that caution necessary to be obtained when traveling a thoroughfare upon which he should reasonably be prepared to anticipate such an occurrence.

Automobilists Abuse Their Advantage

An automobile traveling at the rate of twenty miles per hour moves seven times as fast as the average pedestrian, or in other words it will travel one hundred feet in the same space of time that a pedestrian will travel fourteen feet, or about one-third the width of the average city street, so that when the pedestrian stepped from the curb the automobilist was far enough away to warrant the foot traveler to believe that the driver, exercising due circumspection, would stop or slow down the movement of his vehicle and give way to the pedestrian. Anyone observing automobile travel will note that the driver of the vehicle almost invariably attempts to force the pedestrian to hasten out of his way.

During the year 1920 a total of 2,139 automobile accidents were reported to the police of Rochester. Of them, 812 were accidents in which 906 persons were injured and 21 killed. Of persons injured, 196 were passengers and 710 were pedestrians. Of the total number of accidents, the character of the vehicles involved were, pleasure cars 999; light deliveries, 168; trucks, 90; and taxicabs, 70. Of the accidents in which persons were injured, the character of the automobiles involved were, pleasure cars, 609; trucks, 100; delivery, 68; and taxicabs, 35.

*Abstract of paper presented at the annual convention of the American Electric Railway Transportation & Traffic Association at Atlantic City, Oct. 3-6, 1921.

The locality in which these accidents occurred with relation to the center or congested section of the city, 144 occurred in the business or congested district; 301, outside the congested district but within the mile circle; and 461, outside the mile circle. Three of the fatal accidents occurred in the congested district, ten outside of the congested district but within the mile circle and eight occurred outside the mile circle. You will note that the greater number of accidents occurred at points remote from the congested district, which goes to show that they occurred where the drivers of vehicles and pedestrians also feel most secure from danger, and too, it indicates greater carelessness of both pedestrian and drivers in the outlying districts.

Accidents Are Frequent At Intersections

Another important phase of the accident problem is the location on the street where they occur, of the 2,139 reported, 1,153 happened at street intersections, and 986 elsewhere. Four hundred and thirty-six persons were injured in accidents occurring at street intersections and 470 in those that happened elsewhere.

Though the automobile accidents are more numerous than they should be, yet, when we consider the number of automobiles traveling the streets daily the proportion of accidents to the number of automobiles is very small. There are 36,274 automobiles owned by persons living in Monroe County, N. Y., and all of these are operated on the streets of Rochester at one time or another. This being the fact, and, too that but 2,139 automobile accidents were reported, it is readily apparent that only a very small proportion of drivers are careless or reckless; to be specific, 6 per cent. This, in my judgment, is a very creditable showing, but we can and must make a better showing. We have by experiment and practice demonstrated that accidents can be prevented, and that by extending the preventive measures now used, their number can be further reduced.

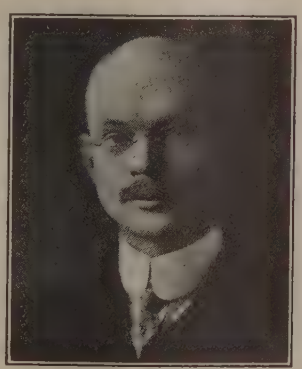
Are we then going to permit this most useful vehicle because of its misuse by the few incompetent or reckless operators to become the modern "Juggernaut"?

Picking Men for Jobs in the Transportation Department*

Six Principles Based on Employment Practice in Other Fields Are Suggested as Useful in the Selection of Transportation Employees

By Henry H. Norris
Managing Editor
Electric Railway Journal

THE report of the committee on personnel and training of transportation department employees is to be commended from several considerations. In the first place, it has been prepared with definiteness of purpose, its scope is reasonable, and the committee has evidently had in mind the formulation of guiding principles rather than detail of practice. The second feature of this report is its brevity. In its few pages, however, there is condensed a wealth of suggestion. In the comments which follow the topic of the selection of employees will be considered from the analytical point of view. Having had no personal experience in employing men for the transportation department of the electric railway, the writer can give only the results of his observations, combining with these some suggestions based on a general study of modern methods of employment in other fields. The attempt has been made to formulate certain guiding principles, which will be phrased in concise form.



HENRY H. NORRIS

Principle I.—The selection of employees is so important a function that it should be intrusted only to the most competent man available.

This principle requires no argument. It has not always been recognized, however. In the manufacturing industries it is now being stressed mightily, the war having given the impetus to increase in production efficiency through skilled selection of workers.

In selecting employees the electric railway employment department has two things in mind, in addition to the desire to fit a good man to a good job. First there is the ambition to keep down the labor turnover. The second is the possibilities of the applicant as a transportation salesman. How quickly and completely will he come to be at ease in the performance of his duties? How promptly can he store his mind with the facts and principles of the business so that he will be able to give patrons the information which they desire? How quickly can he become skilled in that essential function of the modern platform man, "selling the service?"

These questions suggest the statement of another principle, namely:

Principle II—Selection of employees on the basis of quality is infinitely more important than the purchase of materials to specification.

There was a time a few years back when it was impossible to choose carefully among applicants because there were not enough applicants to go around. Now we can begin to look for this quality of salesmanship, regarding which so much has been said but so little done. Obviously merchandising transportation involves merchants, or salesmen, so that the following principle applies to this aspect of the electric railway business with great force:

Principle III.—The qualities which in other lines of business enable a salesman to sell are needed in the platform man, particularly the conductor.

These qualities are declared by the committee to include "personal appearance, bearing, manner of answering questions, and ability to carry out simple instructions promptly and correctly." A great deal can be learned by studying an applicant carefully with these points in mind. But in doing this it is not enough to look a man over and guess that he is all right or otherwise. If a quality is worth desiring it is worth testing as far as testing is practicable. This is all that the much advertised, and rightly advertised, intelligence tests do; that is they measure things that were formerly determined by guesswork. To put this more concretely:

Principle IV.—Snap judgment is not safe now, and never was safe, in the selection of employees.

Suppose the committee's suggestions as to rating considerations in elimination tests of electric railway transportation employees be listed, in the following manner:

1. Personality: (a) personal appearance, (b) bearing, (c) manner of answering questions.

2. Mentality: (a) Ability to execute simple instructions promptly and correctly, (b) mental alertness, (c) judgment.

The candidate cannot, of course, rate himself by answering questions, except as to matters of fact. Snap judgment by the employing officer is just as bad; but what is to take its place? This leads to:

*Abstract of paper presented as part of the discussion on the report of the committee on personnel and training of transportation department employees at the convention of the American Electric Railway Transportation & Traffic Association, Atlantic City, N. J., Oct. 3 to 6, 1921.

Principle V—If personal and mental qualities are to be considered at all in selecting employees, some kind of objective analysis should be made.

No absolute scale of rating in the qualities listed is possible. On the other hand, some people undoubtedly answer questions better or carry themselves better than others. In other words, qualities can be compared with each other even when they cannot be compared with a standard. This is really what is needed, for the purpose is not to pick out paragons, but rather to select the best among a group of applicants. For example, as a test for rating personal appearance, the following is suggested:

Consider men in groups of ten at a time, including in each group say two employees who are satisfactory but not remarkable. Make a list of these men, arranged in order of merit. Get some one else to do the same independently. Compare notes. Repeat the process for the other qualities. Combine the results so as to get a general scale of rating for the group. An experienced personnel man believes that in such a rating scale the best man may easily be five times as good as the poorest.

To make the matter more specific, such questions as these should be kept in mind in rating for personal appearance: (a) Is the applicant well proportioned? (b) Has he the appearance of good character and habits? (c) Are his clothes carefully selected and neatly kept, and his shoes polished? (d) Does he show reasonable care in the preparation of his toilet; hair brushed, nails clean, face shaved, etc?

These questions are simply the application of the committee's suggestion that personal appearance be considered. If it is to be considered at all, it should by all means be considered in reasonable detail.

The questions which might be asked in connection with the bearing of the applicant would include: (a) Does he carry himself well? (b) Does his bearing suggest courtesy? (c) Is he pleasant without being servile? (d) Is he alert and active in manner? (e) Does he look like a real man's man?

As to the manner of answering questions, these queries may be suggestive: (a) Do his oral answers show thought? (b) Does he meet your eye in answering oral questions? (c) Are his oral answers complete but concise? (d) Is he reasonably quick in giving either kind of answer?

While these questions may seem trivial and unnecessary, are they not of the type that one unconsiously has in mind in judging the personality of another? If so, then they may well be formulated. This is what was done on such a large scale by the celebrated army tests, from which electric railway men can learn a lot that will help them in their business. In fact, it may properly be said here that:

Principle VI.—While freak "psychology" should be avoided in selecting employees, modern science should not be ignored.

The matter of personality has been gone into in some detail, to illustrate the principle of rating which is applicable to it. The subject of mentality, as broached by the committee, opens up a still wider field for comment. All that can be done here is to outline a few essential features. Mentality can be rated much more definitely than personality. Possibly the army tests, suitably modified, may be found useful in electric railway work. They are being applied in other branches of industry.

The committee's requirement of "ability to execute simple instructions promptly and correctly" lends itself to objective testing admirably. For example, it can be gaged by: (a) Manner of filling in the application form. (b) Manner of applying for the medical examination. (c) Manner of performing some elementary feats with the rule book.

Science has definitely proved that mental alertness can be tested with reasonable accuracy. At the same time the men should not be asked to do any "fool stunts" which would appear ridiculous to them.

In addition to mental alertness, the quality of judgment is also susceptible of rather accurate measurement, but for the present purposes it can be gaged fairly well from the data already gathered.

In the foregoing outline attempt has been made to apply the magnifying glass to a small but highly important section of the committee's report. To carry out the committee's suggestion to a logical application involves more study than has been given to the matter so far. With the approval of the executive committee it might be well for a future committee on this subject to investigate such matters as the following:

(a) To what extent are psychological tests being used in the transportation departments of electric railway properties, and with what results?

(b) In what ways might such tests profitably be used?

(c) What tests could the committee itself make along this line, and what records should be kept that would be of real value to the industry?

(d) What standards, if any, could be recommended, and what procedure might be followed in determining the personal and mental qualities which are desirable in employees of the transportation department?

Finally, the writer wishes to reiterate what he has said regarding the importance of intelligent selection in employment work, preferably with some kind of a rating scale. In going over this matter with a practical psychologist the writer was urged to stress this point in discussing the committee report.

He cited the case of an insurance company which was selecting a manager. One applicant was well known and well liked by the directors. A rating scale showed the directors and the applicant himself that he was not the man for the job.

There is another element in this careful rating of men. If a promising man turns out not to be fitted for the duties of the transportation department, he may be just the one for some other position in electric railway service. Some manufacturing concerns have a rule that when it is necessary to refuse employment to an applicant, the refusal shall take such form as to leave the man in a friendly frame of mind. Nothing will do this better than to show a helpful interest in finding him a place to which he is naturally adapted.

The Banquet

A DEPARTURE from recent custom was the banquet, which occurred Wednesday evening in the Renaissance Room of the Hotel Ambassador. About 800 in all were present, including many ladies.

After the dinner the first speaker was President Gadsden, whose topic was "Salesmanship in Transportation." An abstract of his remarks appears elsewhere in this issue.

The second speaker was Prof. J. Duncan Spaeth of the department of English at Princeton University and the coach of the varsity crew. After describing many of the advantages of electric railways as a transportation medium Professor Spaeth gave an inspirational address on the reasons for success in large undertakings. He urged the use of the law of things in dealing with equipment and the law of men in dealing with men. To secure service and power these two fundamental laws must be joined.

The dinner was followed by informal dancing and music in the Venetian Room at the Hotel Ambassador.

Election by Accountants

THE sessions of the American Electric Railway Accountants' Association will be reported in next week's issue. The following officers were elected for the ensuing year:

President, Frederick E. Webster, vice-president and treasurer Massachusetts Northeastern Street Railway, Haverhill, Mass.

First vice-president, W. G. Nicholson, secretary and auditor Omaha & Council Bluffs Street Railway, Omaha, Neb.

Second vice-president, E. M. White, treasurer Binghamton (N. Y.) Railway.

Third vice-president, W. A. Doty, auditor Denver & Intermountain Railroad, Denver, Col.

Secretary-Treasurer, F. J. Davis, auditor's department, Public Service Railway, Newark, N. J.

For members of the executive committee, J. J. Duck, general auditor Chicago Surface Lines; R. N. Stevenson, chief clerk to comptroller, the Connecticut Company, New Haven, Conn.; Wallace L. Davis, auditor Lehigh Valley Transit Company; G. H. Caskey, auditor Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va.

Proceedings of the American Association

The Constitution Offered by the Executive Committee Was Adopted After a Few Changes Had Been Made—More than 1,200 Were Present—Exceptional Group of Financial Papers Presented—Hoover Sends Message on Interdependence of Railways and Other Industries.

THE first session of the American Electric Railway Association was called to order at 9:50 Tuesday morning by President Gadsden, who without further introduction gave the presidential address. He first told about the defalcation at the New York office and the action taken by the court in the case of the defaulter, Gibson. In this connection he said: "I want to take this opportunity to say that after the strictest investigation, the result of our consideration of this subject convinced me, and I am satisfied convinced the other members of the special committee in charge of the matter, that our ex-secretary, E. B. Burritt, was free from any moral complicity in that matter. In view of his long association with us and of the high esteem in which we held him I think it is due to him that I should make that statement to his friends here assembled." He also explained the arrangement made by the court by which the defaulter will endeavor to pay back the sum taken.

Continuing, President Gadsden said that when this situation became apparent, the executive committee, instead of making drastic reductions in the service of the association or cutting down the payroll, determined at first to make a thorough investigation of its own affairs. Some reductions were made in expenditures, but a more important step was the determination to consider whether the association as at present organized was the best possible fitted to solve the questions being thrust upon it. A reconstruction committee was appointed and made a most exhaustive and painstaking inquiry into every phase of the parent association and those affiliated with it to determine what steps should be taken for improved future conditions.

In the opinion of the speaker the fundamental weakness of the organization, as disclosed by the research of the reconstruction committee, was the fact that the association was not, in fact, being conducted by its officers, but the custom had grown up for the executive committee to meet only on the call of the president, and then only to consider some special or emergency matter. Hence the most important change in the proposed constitution is the provision that the board of directors—the executive committee—meet monthly. There has been some criticism of the provision that the association could not get the kind of men it wanted if they would be obligated to attend a meeting of the board once a month. The speaker's answer to that

PHILIP H. GADSDEN
Retiring President

was that that is the practice followed in the two other public utilities associations, the gas and the electric associations. If a man can be made to feel in accepting a position on the board that he is actually taking part in the management of this great industry of ours the position will be sought after. In the judgment of the speaker as much depends upon the periodic monthly attention of the board as on anything else.

The speaker then discussed briefly a number of the questions which were to come up at the meeting, particularly in connection with the report of the reorganization committee. One of these was whether a municipally owned property should be eligible for membership. Another was a clause providing that the executive committe shall have power to admit to membership in the association transportation companies other than the electric railways, which include trackless trolleys and motor buses. The speaker said he hoped this topic would be thoroughly discussed. He also said he wished to emphasize another phase of the committee's report, namely, the question whether the work being performed by the magazine of the association, *Aera*, was essential or could not better be performed by the technical press. Statements, he said, have been made also that the advertisements in *Aera* were not obtained on their merits, but that they were largely influenced by friendship or by a mild species of sandbagging; that is to say, that the manufacturers were held up, and that, therefore, the money spent in advertising represented a duplicate expenditure on the part of the industry, unnecessary duplication, and therefore a waste which ought to be stopped.

Continuing, the speaker said that the question has sprung up perennially, and as it is obvious that the association cannot continue to run a magazine and make it effective as a magazine or successful financially if every year the question of its continued existence is brought up for serious debate and consideration, therefore the reorganization committee requested the *Aera* advisory committee to make a further report covering all phases of the question. The speaker said that he had approached this subject rather in sympathy with the view that *Aera* as now conducted was not justifying itself, but after careful consideration of the report of the advisory committee he became thoroughly convinced, as did, so far as he could recall, every member of the reorganization committee, that the magazine was performing a necessary and useful service to the industry. Moreover, to his surprise, the committee had statements made to it by numbers of manufacturers that so far from looking upon the advertisements of the magazine as a holdup, they considered it one of the best mediums for advertising that they knew of. Hence the committee recommended that the magazine should be continued and the speaker hoped that this would be considered final.

The speaker then took up matters external to the association and said that he would refer particularly to two phases of the problem. For over ten years, he said, the electric railway industry had been held in slavery to a fixed 5-cent fare. The public and the companies, ever since the establishment of the street railway industry, had been worshiping at the shrine of the nickel. But at last the industry, along with all other business in this country, has come to a point where it is recognized by the public that the price of the electric railway ride must bear a definite relation to the value of the service to the car rider. That is of tremendous importance to the industry. The roads, in some isolated cases, may go back to a 5-cent fare, but only because it is justified under the conditions which may exist at that time. The fetish of the 5-cent fare has gone forever in this country.

That is what has happened to one of the fixed ideas in the mind of the public. Another was that once a street railway was built and put into operation it could never cease to run. Once a railway, always a railway. The public recognized that if a textile, metal or a shoe factory or an automobile con-

cern could not sell its goods at a profit it would close down, but in some mysterious way the public got an idea that the street railway was immune from the operation of economic laws and would keep on operating notwithstanding the fact that its cost increased and it was unable to get an adequate fare. The situation in Des Moines has destroyed that illusion. For more than thirty days a city of over 126,000 inhabitants has been without facilities of street railway service. The result is that at no time over 50 per cent of the travel that used to be handled by the electric railways has been handled by any system of transportation in the city of Des Moines except for a week when the fair was held, when the return to the company was guaranteed. The balance of the people either had to stay at home or walk. The result to the merchants of the town has been simply disastrous. Recognizing how important this demonstration at Des Moines was to this industry of ours, the association arranged that Mr. St. Clair should go to Des Moines, and he spent three weeks studying that situation and sent out from Des Moines re-

Secretary-Treasurer's Report

AMERICAN ELECTRIC RAILWAY ASSOCIATION
BALANCE SHEET, SEPT. 30, 1921

Cash	$15,800	
Investments	600	
Furniture and equipment	4,957	
Emblems	556	
Paper	651	
Petty cash at New York	750	
Petty cash at Washington	100	
Accounts receivable	9,979	
Public relations fund		$1,991
Committee on national relations		2,416
U. S. mail pay committee, 1920		*1,174
National committee on public utility conditions		*356
U. S. mail pay fund, 1921		1,162
Notes payable		15,000
Surplus		14,437
	$33,476	$33,476

*Deficit.

INCOME STATEMENT
Eleven Months Ended Sept. 30, 1921

REVENUES

Admission Fees		
Railway companies	$60	
Manufacturing companies	70	
		$130
Annual dues		
Railway companies	127,351	
Manufacturing companies	20,873	
Individuals	2,137	
		150,362
Miscellaneous income		
Interest on deposits	$463	
Interest on investments	31	
Sale of Year Book and Proceedings	82	
Sale of Engineering Manual and binder	322	
Sale of bibliography on valuation	.....	
Sale of miscellaneous pamphlets	1,000	
Sale of service at cost	194	
Sale of dinner tickets	6,240	
Contribution from Hotel Men's Association	4,082	
Discount on purchases	149	
Convention dinner, 1921	1,572	14,139
		$164,631

Aera

Advertising	$15,665	
Subscriptions, railway companies	4,120	
Subscriptions, manufacturing companies	1,353	
Subscriptions, individuals	1,448	
Subscriptions, com any section members	1,726	
Paid subscriptions	434	
Sale of extra copies	64	
Sale of binders	76	
		24,899
Total revenues		$189,530

EXPENSES

American Association	$124,331	
Engineering Association	4,271	
Transportation & Traffic Association	1,109	
Accountants Association	873	
Claims Association	811	
Aera Association	35,705	
Total actual expenses	$167,101	
Defalcation	73,017	
Total expense as shown	$240,118	

EXPENSES OF AMERICAN ASSOCIATION
Eleven Months Ended Sept. 30, 1921

Salaries of general office staff	$40,762
Rent of office and storerooms	5,237
Stationery and printing	22,067
Postage	3,045
Office supplies and expenses	1,271
Telephone, telegraph and messenger service	2,590
Express, freight and cartage	156
Traveling expenses of secretary and office staff	762
Expenses of standing committee of American and affiliated associations	148
Printing of association publications:	
A—Advance paper, proceedings, Year Books	2,029
B—Engineering Manual	.....
C—Service-at-cost plans	.....
D—	.....
E—	.....
F—Other publications	855
Miscellaneous association expenses	13,474
Expenses of mid-year dinner:	
A—Mid-year dinner expenses	7,060
B—Other mid-year meeting expenses	3,252
Expenses of annual convention (current year):	
A—Exhibit expenses	.....
B—Entertainment and other convention committee expenses	20
C—General convention expenses	143
Expenses of annual convention (prior years):	
A—Exhibit expenses	.....
B—Entertainment and other convention committee expenses	.....
C—General convention expenses	10,004
Written off to profit and loss	.....
Sundry adjustments to accounts receivable (uncollectible, etc.)	1,487
Total	$114,369
Salaries and expenses of Washington representatives:	
A—Salaries	5,608
B—Rent	1,414
C—Expenses	2,938
Total	$9,961
	$124,331

EXPENSES OF AFFILIATED ASSOCIATIONS
Eleven Months Ended Sept. 30, 1921

ENGINEERING

Printing of association publications:		
Advance papers, proceedings, Year Book	$3,549	
Engineering Manual	182	$3,731
Expenses of committees		524
Miscellaneous		15
		$4,271

TRANSPORTATION & TRAFFIC

Printing of Association publications:	
Advance papers, proceedings, Year Book	$978
Expenses of committees	95
Mid-year dinner expense	35
	$1,109

ACCOUNTANTS

Printing of association publications:	
Advance papers, proceedings, Year Book	$750
Mid-year meeting expense	123
	$873

CLAIMS

Printing of Association publications:	
Advance papers, proceedings, Year Book	$785
Expense of committees	15
Miscellaneous	10
	$811

SUMMARY OF ESTIMATED INCOME AND EXPENSES FOR YEAR ENDING OCTOBER 31, 1921

Surplus as of Sept. 30, 1921	$14,437
Estimated receipts for October	13,500
Total income for year	$27,937
Estimated expense for October	19,000
Estimated surplus at end of year	$8,937

EXPENSES OF *AERA*
Eleven Months Ended Sept. 30, 1920

Salaries of *Aera* staff	$10,475
Rent of office	678
Telegraph, telephone and messenger service	625
Postage and express, office	152
Traveling expenses of *Aera* staff	1,116
Miscellaneous *Aera* expenses	737
Magazine expenses:	
A—Cost of printing	18,506
B—Cost of paper	1,729
C—Cost of cuts	1,167
D—Mailing charges	449
E—Express, freight and cartage	.....
F—Envelopes for mailing	67
Total	$35,705

ports to the various committees of publicity throughout the United States.

As long as the public was under the delusion that whatever happened, irrespective of the cost of operation, irrespective of the fact that platform wages had gone up 100 per cent, that taxes had gone up 40 and 50 per cent, in short, notwithstanding any abnormal increases of operation that might be laid upon a company it had to operate at a nickel, why should it be interested in solving the railway's problems? Street railway men must realize that some day, when conditions justify it, they will not be able to escape the demand for a decrease in the charge for transportation, but before serious consideration can be given to that proposition there must be a substantial liquidation in the cost of labor in the street railway industry.

In view of the community of interests which exists between the car rider and the companies the latter properly can call upon the communities which they serve to support them in a proper and legitimate effort to get this wage scale down to a point which will permit this industry to function.

The speaker then called attention to the activities of the Committee of One Hundred, whose work he considered as absolutely essential to the furtherance of the interests of the association. Yet the committee reports that only 56 per cent of the companies have responded favorably to the appeal of the committee for support. This indicated to the speaker that there must be something radically wrong with the viewpoint of some of the managers.

Reports of Executive Committee and Secretary and Treasurer

The report of the executive committee was then read. It was ordered filed.

Mr. Welsh then read the reports of the secretary and treasurer. The latter is given in the tables on page 610.

The secretary's report described the activities of the association and the work done at headquarters for the association year. The mid-year dinner and conference, held at Chicago on Feb. 10, 1921, was first mentioned, after which the defalcation which caused the resignation of the former secretary was taken up.

In the emergency which arose in view of the above disclosure, President Philip H. Gadsden gave his undivided attention to the work of the association for a considerable period and, together with the auditor, M. R. Boylan, actively directed the prosecution of the case and otherwise personally investigated the entire conduct of affairs at association headquarters. A number of meetings of the executive committee were held during this period for necessary authorizations in connection with these matters.

A committee on reorganization was authorized to study the association's form of organization, the methods prescribed for carrying on its various activities, a revision of the constitution and by-laws, the efficiency of the headquarters staff in executing the work of the association and to recommend a permanent secretary.

A sub-committee was appointed to redraft the constitution and by-laws, consisting of H. V. Bozell, Harlow C. Clark and the acting secretary. As a result, there will be presented to the convention a revised constitution and by-laws and a series of general recommendations on current matters. The reorganization committee also recommended the appointment of J. W. Welsh as secretary to be effective as of July 1, 1921, and this recommendation was later confirmed by the executive committee.

Attention was called to the work of the affiliated associations, particularly to that carried on by the standing committees of the engineering association. In the Transportation & Traffic Association will be found a series of reports bearing on the vital current problems of economic operation and service to the public.

The most notable activity of the association during the year was the formation of the advertising division of the bureau of information and service, under the direction of Labert St. Clair, who is well known to members of the association. This important work was made possible by the active financial campaign carried on under the auspices of the Committee of One Hundred.

The association has maintained during the year its Washington office under the direction of Charles L. Henry, chairman of the committee on national relations. Mr. Henry has found it necessary to devote considerable time to this work as numerous matters of national legislation have been pending.

The association has taken out membership in the National Safety Council and is co-operating with that organization, through its Transportation & Traffic Association, in the furtherance of safety work.

The association also continues to be a member of the National Industrial Conference Board and has furnished the membership with information relating to general industrial conditions, such as the cost of living, financial and labor statistics, etc., as compiled by that board.

Through its engineering association, the development of engineering standards in a national way is now proceeding under the auspices of the American Engineering Standards Committee. This work is carried on in connection with the principal national engineering societies of other industries, and as both the manufacturers, the consumers and disinterested engineers are represented on all committees, it is believed that the standards so effected will be both practical and acceptable to all concerned.

The association is also a member of the Federal Highway Council, which is considering broad questions of adequate facilities for highway transportation and suitable regulations for highway traffic.

As a result of approval by the executive committee at its Chicago meeting, the committee on mail pay was authorized to solicit the financial assistance of member companies handling mail and to exercise its judgment in the application for increased rate before the Interstate Commerce Commission. Funds have been solicited from member companies, and the report of the committee indicates that progress has been made.

The general publication policy of *Aera* has been maintained this year as heretofore. During the year there were published 108 special and contributed articles and 174 questions with 1,104 answers in the Question Box. The advisability of continuing the magazine was again suggested as a possible means of reducing expenses, but at the request of the president the *Aera* advisory committee submitted a further report on the subject, and as a result the reorganization committee recommended the continuation of the present policy to the executive committee.

One new company section has come into association membership. This is the Camden Section of the Public Service Railway. Special credit is due to Martin Schreiber, who was a most active supporter of this form of association membership.

The association's record for membership is most encouraging, there being a net loss of only two small railway companies. In the case of the manufacturer companies some of the smaller companies whose membership was largely due to the annual exhibit have been withdrawn. The net loss in this case is fourteen, making a total loss of sixteen companies during the year.

Unfortunately, the committee on membership has not been able to carry out the program which it planned after the mid-year conference, due largely to its desire to await the report of the reorganization committee before making an active campaign for membership. That the association has been able to hold its own under these trying circumstances is considered of especial significance and most encouraging for next year's prospects.

As a result of the loss of the association's funds and in response to an appeal from President Gadsden, a very drastic curtailment was made in the operating expenses of the association. Consideration, however, was given to the necessity for maintaining the essential functions of the association's service to its members, and the economies effected are believed to have been accomplished without any material abridgement in this respect. Briefly, these consisted in reducing the association's force, including the publicity department and the Washington office, from thirty-nine to thirty employees; abandonment of additional office space contracted for adjacent to the present quarters, as well as the abandonment of outside storehouse facilities, closer supervision in the use of office materials and supplies, reduction in

the postage, telephone and telegraph accounts and the curtailment in the number of circular letters and questionnaires. In addition economies were effected in the publication of *Aera*, largely by a more efficient mechanical set-up.

The work of the bureau of information and service continued to increase even above the phenomenal record made last year. The average number of monthly requests for information was 810, as compared with 545 last year. This made a total of 9,718, as compared with 6,532 in 1920, an increase of 49 per cent.

Discussion on Revised Construction

President Gadsden then said that the next order of business was a discussion of the proposed revised constitution and by-laws, and as he desired to enter into the discussion he asked Vice-President Todd to take the chair. At the request of Chairman Todd, Mr. Bozell of the reorganization committee then gave an account of the work of the reorganization committee and explained that the first clause of the constitution permitted members to make changes in the proposed constitution from the floor, this clause to become inoperative after the 1921 convention.

W. H. Sawyer, president East St. Louis & Suburban Railway, explained that during the revision of the constitution he had probably opposed more measures in the revised draft than any other three members of the committee. Nevertheless, he moved that the recommendations of the executive committee be adopted in their entirety. The association, he said, was faced with the necessity of adopting some constitution, and the executive committee had spent much time on this work. While he did not believe that the constitution was as good as it might possibly be made, it was a thoroughly workable constitution, and it permitted changes to be made in it without great difficulty. He believed it would simplify matters at the present meeting to adopt the constitution as drafted as many parts were correlated and it might be difficult to change one without affecting other parts.

A general discussion then followed as to the method of procedure to be followed and the plan was finally adopted that it would be acted upon clause by clause.

The most extended discussion related to whether carriers other than electric railway companies and electrified sections of steam roads should be admitted to membership. The argument in favor of this plan was principally that many railway companies were now considering the use of buses for auxiliary and supplemental service, and the admission of bus companies into membership would allow the association more fully to study the situation and bring to the membership at large all the information and experience available in this form of transit. The principal argument against the admission of such companies was that a wrong impression would be produced by the action, people thinking that the railway companies had lost faith in the value of the trolley car for urban and interurban service and were planning to abandon it in favor of the bus.

One speaker, arguing in favor of the second view, said that a bus manufacturer had recently sent out a circular descriptive of his bus and included the statement that "eminent authorities had agreed that electric railways had been relegated to the past." He thought that the proposed action by the association would confirm this impression. At the same time there was general agreement that the bus would be used by electric railway companies to a considerable extent in auxiliary and supplementary service and several speakers have declared that there are already plans for such use.

The decision finally reached was that such companies would not be eligible to membership, the point being brought out that this clause could be changed at any time in the future when a change seemed desirable.

Following the discussion on buses, the next point which was raised in modifying the proposed constitution was to eliminate the provision that an executive committee member could be represented by proxy and also the next provision that an executive committee member would automatically lose his office if absent for three consecutive meetings.

With these changes and with one or two slight corrections in wording the entire constitution and by-laws as revised were adopted.

The association also approved the recommendations of the reorganization committee as to certain questions of policy or practice. These were outlined in the ELECTRIC RAILWAY JOURNAL, July 16, page 105. In the same place and in the issue of Aug. 13, page 249, are outlined all the changes in the constitution which were considered, so that with the report above and these previous two reports a complete picture of the new constitution is had.

At this point President Gadsden announced certain committee appointments. As a substitute for P. S. Arkwright, Atlanta, Georgia, who was not present at the convention, Charles H. Harvey, Knoxville, Tenn., was appointed on the nominating committee. The committee on resolutions was named as follows: P. N. Jones, Pittsburgh, chairman; E. B. Wisner, St. Louis, Mo.; H. V. Bozell, New York; H. H. Aiken, Philadelphia, and B. J. Fallon, Chicago. The appointments on the committee on recommendations in the president's address were as follows: Edward Dana, Boston, chairman; G. W. Jones, Brooklyn, and Harlow C. Clark, Newark, N. J.

Following this the report of the *Aera* advisory committee was read by Charles L. Henry, chairman, and is abstracted herewith. The reaching of other committee reports scheduled for this session was dispensed with because of lack of time. This disposition included the reports of committees on membership, company sections.

Aera Advisory Report

The committee has found the year now closing a very busy one. Early in the year the apparent necessity for a reduction of expenses was brought before the committee by the president of the association with a request that so far as practicable, without injury to the magazine, the expenses of this publication be cut down. With a view to doing this various economies were instituted, resulting in a saving of approximately $700 per month. The necessity for an acute retrenchment referred to having passed, the convention number of *Aera* has resumed its former completeness.

After the executive committee had appointed what was afterward known as a reorganization committee, with a view to making recommendations regarding any changes in the management of the affairs of the association, this committee was asked to report to the reorganization committee its views regarding the publication of *Aera*. In compliance with that request, this committee made a full report to the reorganization committee concerning the publication of the magazine, of which the following quotation is a complete summary:

"We would make *Aera* a bigger and better magazine in every respect than it has ever been, understanding, of course, that this cannot be done between sun and sun, but must be done day by day, week by week and month by month."

Notice was taken of various suggestions made in different ways and at different times and by various persons concerning certain features of the publication of the magazine, none of which the committee deemed necessary to put in its report. The report was presented to the reorganization committee, which accepted the report as presented.

Notwithstanding the general business depression, the volume of advertising in the October issue of the magazine is the greatest it has ever had. The committee looks forward to the carrying out of the wish expressed in its report, and that with the help of all concerned this association will have a better and greater magazine. The report is signed by Charles L. Henry, chairman; Myles B. Lambert, Edwin C. Faber, Martin Schreiber, Charles C. Peirce, R. E. McDougall, A. M. Robinson and I. A. May.

Service-at-Cost Franchises

After the completion of the reading of this report Edward Dana presented a paper on "Contrasted Advantages of Service-at-Cost Contract Franchise and State Regulation," which was followed by formal discussion by Robert I. Todd and S. B. Way. These are published elsewhere in this issue.

In the discussion Walter Jackson reviewed the principal features of two new contracts entered into during the

past year in Paris. The first of these involved the purchase and consolidation of seven or eight systems purchased by the Department of the Seine, giving public ownership, but turning the operation over to a private managing association. The credit of the companies was so bad that money needed for improvements was to be raised by the state. The state was also to assume any deficit from operation. The Department of the Seine exercises a most minute control of all the details to insure adequate service and proper expenditure of funds. Incentive to the management was provided in the form of a percentage of any savings effected not resulting from a lowering in the standard of service or the number of passengers carried. No such saving has been shared to date.

The other franchise referred to covered the underground railways, and this provided that the operating company should receive so much per passenger carried, thus providing a direct reward for the usefulness of the railway.

In this case also the state would make up any deficit and a reward to the management for making any saving in operation was provided, though none as yet has been shared. In this case the employees derive about 4 per cent of the earnings, which is divided so that the trainmen get twice as large a proportion as the employees not in contact with the public.

The meeting was then adjourned.

Wednesday's Session

The second session of the American Association was called to order, with President Gadsden in the chair, at 9:40 Wednesday morning. The first order of business was the report of the mail pay committee, which is published in abstract below:

MAIL PAY

Early in the year the committee requested and received from the executive committee authority to proceed with a new application to the Interstate Commerce Commission for further adjustments in the rates paid electric railways for handling United States mail. Preparations to this end were made and W. H. Maltbie of Baltimore was engaged as counsel.

Shortly after the new Postmaster-General was appointed we got in touch with Second Assistant Postmaster-General Shaughnessy and were assured of the co-operation of the department in preparing our case, to the end that if we could prove our rates were not justly compensatory, the matter could be submitted to the Interstate Commerce Commission for a decision. The department has agreed to co-operate with the committee in obtaining information by means of a joint data sheet and the submission to the commission of agreed facts, which should prevent the necessity for long hearings or the need of sending a committee around the country to take evidence.

We have submitted a proposed data sheet to the Post Office Department, and after going over it it in turn submitted to us a number of forms calling for the information it felt was necessary.

At the present time we have up with the department the welding of these suggestions into a joint data sheet, and as soon as agreed upon it will be sent out with a request for prompt attention on the part of electric railway companies.

The committee in presenting the previous case to the Interstate Commission requested, first, that electric railway mail carriers be relieved of side and terminal service and, second, that the actual carriage of the mail be compensated for on a count basis. The Post Office Department, on the other hand, requested the commission to place compensation upon a weight basis, to be determined by periodic weighings.

ROBERT I. TODD
Newly Elected President

The commission in its final decision relieved the roads of side and terminal service or, in cases where this was not entirely practicable, provided compensation therefor, although at a rate not entirely satisfactory to the committee, but rejected both the request of the committee for a count basis and the request of the Post Office Department for a weight basis and adjusted the compensation for electric railway mail carrying on a space basis, using 30 cu.ft. as a unit space excepting in independent cars, R. P. O. cars and R. P. O. apartments, in which the linear car-foot was adopted as the unit.

The committee has made no effort either in the evidence or on brief to present an independent study of the cost of rendering the service, both in view of the complexity of the problem and the very great difficulty, if not impossibility, of securing such data as would make an accurate cost determination possible. In lieu of such a determination we assumed as reasonable the prior rate at the time when it was first promulgated by the Post Office Department, and then pointed out both the increase in operating cost and the increased volume of mail carried as fully justifying rates higher than those requested by the committee. The Post Office Department, on the other hand, did present to the commission a brief study of the cost of rendering this service based upon certain data as to average operating costs per car-mile and average car length, resulting finally in the conclusion of the Post Office Department that the average cost per linear car-foot-mile, including all operating expenses and a return on property invested, was 7.66 mills.

This study, corrected at certain points where the commission considered the figures too low and translated from linear car-foot-miles into cubic foot-miles, formed the basis of the commission's final determination of costs.

Inasmuch as the theory of the Post Office Department, apparently accepted by the commission, fixed as fair compensation per linear car-foot-mile the cost of producing the linear car-foot-mile, it is equivalent to the assumption that all linear car-foot-miles produced are marketed, since otherwise compensation should be determined by distributing the cost of production over the portion of the product finally marketed. The committee has therefore been engaged in the collection of data on the subject of the ratio of passenger-miles to seat-miles and believes that it will be possible to establish before the Interstate Commerce Commission the fact that at the maximum the number of seat-miles marketed for the industry as a whole does not exceed 50 per cent of the seat-miles produced, or, in other words, that if pouch mail is to be treated as taking the place of passengers and paying upon the same scale as the passengers the price for linear car-foot-miles used should be at least double the cost of producing a linear car-foot-mile. This, and the increase of operating costs since the collection of the data submitted to the commission in the previous case, constitute the major points upon which the new case is to be based.

The committee has recently asked for definite authority from the individual electric railway companies, so that we can go before the commission as representing the industry specifically as well as at large. During the winter, a request was made upon companies handling mail to underwrite the expenses of the new case to the extent of 4 per cent of their mail revenue. The response to this request was not particularly encouraging. However, sufficient funds were guaranteed to enable the committee to go ahead with its work, and we anticipate that the total cost of our case will be met by contributions from those companies which have agreed to contribute, plus such aid as the association itself can extend.

Perhaps it is unnecessary to say that if, as a result of our further studies and investigations, we had not felt that

BRITTON I. BUDD
First Vice-President

there was a reasonable possibility of proving our right to an increase, the case would not have been reopened. The report was signed by L. H. Palmer, chairman; Gordon Campbell, Charles L. Henry, G. K. Jeffries, R. A. Leussler, Samuel Riddle, W. S. Rodger and C. L. S. Tingley.

The report of the publicity committee was next presented by Barron G. Collier, chairman.

PUBLICITY

The work of this committee during the past year consisted largely in organizing and directing the work of the advertising section of the division of information and service, created Jan. 1, 1921, by the Committee of One Hundred. The work of this section has been in the immediate charge of Labert St. Clair, a former newspaper and advertising man of wide experience, who handled the publicity of the Federal Electric Railways Commission hearings at Washington.

The broad general functions of the advertising section as determined upon at the outset were these:

To offer free suggestion, advice and counsel to all electric railway companies on their advertising and publicity problems.

To prepare and distribute to local companies car cards, leaflets, booklets, newspaper advertisements and other advertising material. (This material is so prepared that it may be altered to meet any local situation.)

To prepare varied series of bulletins on the electric railway situation for the use of speakers before chambers of commerce, rotary clubs and similar organizations; for distribution by bond houses, investment bankers and other institutions engaged in the sale of electric railway securities, and for utility managers to use as a means of promoting good will.

To issue press statements, news stories, speeches and articles of interest regarding the industry to the daily press, magazines and other publications.

To co-operate with state and national public utility information committees.

To act as a general clearing house between electric railway companies for the distribution of all advertising and publicity material which will be of mutual aid.

To make engagements for widely known speakers before national conventions and other large gatherings for the discussion of electric railway problems, and to co-operate with these speakers in seeing that they obtain facts upon which to base their addresses and that their remarks receive proper distribution.

To study the motion picture field in an effort to see what can be done to adapt it to use as an electric railway advertising medium.

During the first month of the section's life it was somewhat hampered by lack of funds, but this obstacle has now been overcome.

The section has been frank in its dealings with the press and has emphasized its desire to be of service to newspapers and periodicals. Whenever news of the industry arises a new story or statement is prepared in a form likely to meet the needs of the press associations and it is distributed by the director of the section. The committee reported a number of examples of important news stories prepared and handled by the section.

C. D. EMMONS
Second Vice-President

A noteworthy feature of the year's work was the inauguration of "Electric Railway Day." This was successful despite the fact that less than four weeks' notice of the proposed celebration, on May 4, was given the companies. It is hoped that this day, the anniversary of the inauguration of electric railway service in Richmond thirty-three years ago, may be the occasion of an annual celebration, locally if not nationally.

The section has also distributed, under the committee's direction, a large number of leaflets, suggested window signs, newspaper advertisements, and other forms of advertising. An advertising textbook entitled "Getting the Public Eye and Ear" was also prepared and distributed. Numerous other items of activity were listed in the report.

In conclusion, the continuation of the work of the advertising section was urged, special stress being laid on the financial needs of the industry. Co-operation was urged with state committees and local companies in an effort to get more public speakers to put the industry's message before the peo-

BARRON G. COLLIER
Treasurer

PAUL SHOUP
Operating Member-at-Large

P. S. ARKWRIGHT
Operating Member-at-Large

H. E. CHUBBUCK
Operating Member-at-Large

J. N. SHANNAHAN
Third Vice-President

ple and with the companies and the company section committee in preparing material for the education of employees.

The report was signed by Barron Collier, chairman; C. B. Buchanan, Britton I. Budd, W. A. Draper, C. D. Emmons, S. W. Huff, Horace Lowry and Lucius S. Storrs.

NOMINATIONS AND ELECTION

Following the receipt of this report, the nominating committee made its report through its chairman, John H. Pardee. The committee prefaced its actual nominations with a statement acknowledging the receipt of most useful suggestions from some of the members with reference to desirable candidates for office. The committee recommended that in future years, when the newly adopted provisions for the nominating committee are operating, all members should help the committee by making constructive suggestions, as is the intention.

The committee then presented the following nominations for office:

President: Robert I. Todd, president Indianapolis Street Railway and the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.

First vice-president: Britton I. Budd, president Chicago elevated railways, president Chicago, North Shore & Milwaukee Railroad and president the Chicago Interurban Traction Company, Chicago, Ill.

Second vice-president: C. D. Emmons, president United Railways & Electric Company, Baltimore, Md.

Third vice-president: J. N. Shannahan, president Newport News & Hampton Railway Gas & Electric Company, Hampton, Va.

Fourth vice-president: Frank R. Coates, president Community Traction Company, Toledo, Ohio.

Treasurer: Barron G. Collier, president Barron G. Collier, Inc., New York, N. Y.

Operating Members-at-Large: Terms to expire in 1922—Paul Shoup, president Pacific Electric Railway, San Francisco, Cal.; P. S. Arkwright, president Georgia Railway & Power Company, Atlanta, Georgia.

Terms to expire in 1923—H. G. Bradlee, president Stone & Webster Management Corporation, Boston, Mass.; H. E. Chubbuck, vice-president executive Illinois Traction System, Peoria, Ill.

Terms to expire in 1924—R. P. Stevens, president Republic Railway & Light Company, New York, N. Y.; W. H. Sawyer, president East St. Louis & Suburban Railway, East St. Louis, Ill.

Manufacturer Members-at-Large: Terms to expire in 1922—George H. Tontrup, president National Safety Car & Equipment Company, St. Louis, Mo.; Thomas Finigan, vice-president American Brake Shoe & Foundry Company, Chicago, Ill.

Terms to expire in 1923—Samuel M. Curwen, president the J. G. Brill Company, Philadelphia, Pa.; L. E. Gould, president Economy Electric Devices Company, Chicago, Ill.

Terms to expire in 1924—John G. Barry, manager railway department, General Electric Company, Schenectady, N. Y.; Charles R. Ellicott, eastern manager Westinghouse Traction Brake Company, New York, N. Y.

There were no other nominations and

F. R. COATES
Fourth Vice-President

the meeting, by a unanimous vote, elected the above named nominees to office.

PAPERS ON FINANCE

There were three papers on electric railway finance by H. M. Addinsell, Harris, Forbes & Company, New York; F. E. Frothingham, Coffin & Burr, Boston, and J. K. Newman of Isidore Newman & Sons, New Orleans. Each of them approached the solution of the existing situation from a different angle, but all emphasized many of the same points. Abstracts of these papers are found elsewhere in this issue.

The paper on the comparative position of the traction industry today and four years ago by Edwin Gruhl, New York, who was unable to be present, was abstracted by Harlow C. Clark, Public Service Railway, New Jersey. This paper is given in abstract elsewhere in this issue.

RELATION OF MANUFACTURERS

E. F. Wickwire, Ohio Brass Company, presented a discussion on how the manufacturers of electric railway material could help the industry build up public opinion and incidentally its credit. An abstract of his remarks is published on another page. S. M. Curwen, the J. G.

W. H. SAWYER
Operating Member-at-Large

R. P. STEVENS
Operating Member-at-Large

GEORGE H. TONTRUP
Manufacturer Member-at-Large

THOMAS FINIGAN
Manufacturer Member-at-Large

Brill Company, also furnished a prepared discussion, which in his absence was read by Secretary Welsh.

Olin W. Hill, street railway expert of the Babson Statistical Organization, presented the paper on "Street Railways as an Investment" in the absence of Roger W. Babson. This paper in abstract will be found elsewhere in this issue.

Trackless Transportation

In reporting for the trackless transportation committee, H. B. Flowers, Baltimore, chairman, said that the committee had held three well-attended meetings during the year and had evidenced a keen appreciation of the importance of making a report, but was unable to do more at this time than to make a progress report. It was impossible to agree on any report which the committee was willing to sponsor, hence no report was prepared. Mr. Flowers made this comment particularly to correct an impression which he said had been current that the committee had prepared a report which had been suppressed. This was not the case. He recommended that a similar committee be appointed for the ensuing year and that it endeavor seriously to determine where the trackless trolley may be effectively and profitably used.

W. J. Harvie, chairman of the Committee on Electrolysis, then presented the report of this committee.

Electrolysis

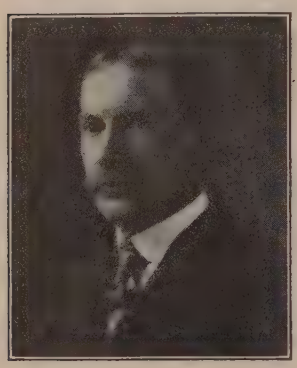
After the publication of its last report, in 1916, the American Committee on Electrolysis was delayed in its activities during the war period, and early in the year 1919 the committee resumed its active work. The most active of the sub-committees has been the one on research, the work of the other sub-committees being in a considerable degree dependent upon the findings of this committee.

After the research sub-committee undertook to work in co-operation with the Bureau of Standards an important question of policy arose. Members of the research sub-committee, and especially the representatives of the American Electric Railway Association, considered that reports upon the conditions prevailing in particular localities should be limited to statements of fact without any expression of opinion as to what should be done to correct conditions. The members of the research sub-committee were of the opinion that there still existed considerable difference of opinion as to methods for mitigating electrolysis troubles and that until the committee had been able to agree upon the principles involved it was premature and unwise to express an opinion with reference to any particular locality. Furthermore, it was considered that in the absence of an agreement as to the engineering principles involved it would be unfair to the local utilities to express an opinion that might cause controversies or even litigation between such utilities. This policy has been strictly followed by the research sub-committee, working in conjunction with the Bureau of Standards in the course of its many investigations in the different cities throughout the United States.

Within the past two years the research sub-committee has conducted active field investigations in Memphis, St. Louis, East St. Louis, Kansas City, Denver and Cleveland. This sub-committee has devoted its attention particularly to the question of pipe joint electrolysis, for the reason that the efficacy of pipe drainage was very largely dependent upon the seriousness of joint electrolysis. Electrical surveys were made in all of the above cities for the purpose of determining the location of pipe joints of high resistance. Excavations to uncover these joints were made and the joints, together with the pipe for some distance on either side of the joint, thoroughly sand-blasted and a very careful examination made. All of the data so obtained were carefully recorded and in many cases include photographs. The committee arrived at the conclusion that joint corrosion does not take place where both sides of the joint are negative or neutral to the surrounding earth. The sub-committee was unable to agree as to the seriousness of joint corrosion. It is, however, the opinion of the representatives of the American Electric Railway Association on this sub-committee that the seriousness of joint electrolysis has been overestimated and that it does not constitute a serious objection to the use of pipe drainage. It has been the policy of the American Committee on Electrolysis and of its sub-committees to arrive at definite conclusions only by the unanimous consent of the different interests represented. There is naturally a difference of opinion with reference to the electrical drainage of underground structures as a mitigative measure.

It has not yet been decided whether or not the American Committee on Electrolysis will be continued in its present form. There is unquestionably a large amount of work to be done before the principles underlying the prevention of electrolysis can be finally formulated. It has been proposed to discontinue the main committee and to carry on the work through what is now the research sub-committee. In the report of this sub-committee, which is incorporated in the report of the main committee, there is included a program (as noted at the end of this report) of future investigations to be made by the research sub-committee in co-operation with the Bureau of Standards. Whether or not this program can be carried out depends upon the financial support that may be given to the committee by the various member associations.

The committee on electrolysis calls particular attention to the report of the American Committee on Electrolysis, which is now being printed and which will be ready for distribution in the near future. This report, although by no means final and complete, nevertheless represents an important contribution to the art. It merits the careful study of all electric railway engineers. The representa-



S. M. CURWEN
Manufacturer Member-at-Large

L. E. GOULD
Manufacturer Member-at-Large

JOHN G. BARRY
Manufacturer Member-at-Large

C. R. ELLICOTT
Manufacturer Member-at-Large

tives of this association, realizing the importance of the work of this committee, have taken an active part in all its deliberations, in the field work of the research sub-committee and in the preparation of the report.

Following is the program of future work recommended by the research sub-committee of the American committee.

1. Development of practical means for measuring current density across contact surfaces of pipes and earth. Such measurements are especially necessary if structures are not kept negative to earth.

2. Development of working means for determining the polarity of structures and adjacent earth in such a way as to eliminate galvanic effects.

3. Study of effect on underground structures of different values of voltage drop in the track and the effect on stray current from rails, including supposed large variation of this relation under different conditions.

4. Cost studies of street railway systems and different methods of power supply to determine the minimum values of track voltage drop consistent with economic operation.

5. Quantitative effect on insulating joints in protecting pipes and cables, assuming railway stray current at economic minimum.

6. Investigation of the distribution of current from pipe to adjacent earth for the purpose of determining whether a diversity factor can be established, *i.e.*, the relation between maximum and average current density.

7. Detailed study of the application and maintenance of such a drainage system as will keep all underground structures negative to earth, including study of the importance of corrosion of railway structures.

8. Comparison of (5) and (7).

9. Continuing study of joint corrosion.

10. Study of soil and galvanic corrosion, with particular reference to its bearing on the problem of corrosion by stray currents.

11. Setting limit of current on gas and oil pipes to avoid fire and explosion hazard.

12. Setting limit of current on power cables to avoid overheating.

The meeting then adjourned.

Thursday's Session

The first matter taken up at the meeting of the American Association Thursday morning was the report on national relations, which was read by Charles L. Henry, chairman. An abstract of this report follows:

National Relations

Soon after the last annual convention representatives of various railway brotherhoods presented to the United States Railroad Labor Board, then recently organized, applications involving some twenty or twenty-five electric railway companies of the country, seeking to have the Railroad Labor Board take jurisdiction of complaints concerning labor matters against the electric railway companies. The questions involved were of interest to all electric railway companies, and this committee immediately took up the matter with the United States Railroad Labor Board, calling in question the jurisdiction of the Labor Board to determine labor complaints against electric railway companies "not operating as a part of a general steam railroad system of transportation," and asked that preliminary to a consideration of any such cases those companies be given an opportunity to present to the Labor Board the question of jurisdiction.

The Labor Board granted this request, and for three days a very extended oral argument of this question of jurisdiction was had before the board in the city of Chicago. At this argument this committee appeared for all the electric railway companies of the country and a number of the companies also appeared personally for themselves. At the close of the argument our committee asked for, and was granted, leave to file a printed brief with the Labor Board on the matters involved and a few days later presented to the board its printed brief, copies of which were sent to all member companies of this association. Very much to the gratification of the committee, the Labor Board decided the question of jurisdiction adversely, holding that the exempting clauses in the transportation act of 1920 excluded from its jurisdiction all electric railway companies "not operating as a part of a general steam railroad system of transportation."

A renewed attempt, very vigorously pressed, was made to have Congress authorize the coinage of a Roosevelt memorial coin, coins of ½-cent, 2-cent, or 2½-cent denominations being suggested. As many electric railway companies had adopted what are known as recording fareboxes, which would, by the adoption of either one of the proposed new coins, require rebuilding so as to accommodate the new coins, the question presented was one of very great financial interest to those companies. It was found that the expense of thus rebuilding these recording fareboxes would involve an expense to the companies using them of between $400,000 and $500,000, and it was also feared that the rebuilding of the fareboxes to accommodate the additional coins would slow them down so as to render them practically useless on some railways where travel was very heavy. At a hearing held by the committee on coinage, weights and measures of the House of Representatives this committee appeared and, at the request of the chairman of the coinage committee, took charge of the opposition to the bill. The committee secured the cooperation of a large number of bankers against the coinage proposed. Mr. Brandt, president of the Brandt Manufacturing Company, which manufactures coin counters especially for the use of banks and similar institutions, and Mr. Johnson, president of the Johnson Farebox Company, both responded to the request of this committee to assist in the hearing. Since the hearing referred to no action has been taken in either of the houses of Congress on the coinage bills and the committee does not believe there is any danger of the enactment of the proposed legislation.

Many questions growing out of the provisions of the transportation act of 1920 have called for the attention of the committee before the Interstate Commerce Commission, and it has frequently appeared before the commission concerning such matters. The commission, however, has moved very slowly on all questions relating to the status of electric railway companies under the various provisions of the transportation act of 1920 and thus far has not promulgated any definite rulings of a general character concerning same.

In the case of the Petaluma & Santa Rosa Railroad this committee assisted the company in presenting its case to the Interstate Commerce Commission, which was decided by the commission on the specific facts concerning that company in the operation of its electric railway. After the decision was rendered the committee wrote to Commissioner Meyer of the Interstate Commerce Commission, who was chairman of the section having the question under consideration, that as a committee it would take no further action in the case. Two paragraphs from the letter to Commissioner Meyer follow:

> It has always been the contention of this association before your honorable body that the transportation act was remedial rather than regulatory in character and must be construed accordingly. It has also been our contention that in order to effect the purposes of the act the conditions of the carriers under it must be considered in each case, and particularly so with reference to inclusion or exclusion in or from section 15s. It is very apparent to us, and must be to you, that many electric roads would be seriously injured by being included in this section, while, on the other hand, there are undoubtedly electric roads the character or business of which not only logically brings them within the provision of this section but practically demands such inclusion.
>
> I wish to state in closing that the association will, of course, at all times, aid its members in properly getting their cases before your commission and in getting to your commission such information as you may desire.

The legislative questions involved by Senate bill 1874, a proposed amendment of the Clayton act and the interstate commerce act as well, has been delegated to a sub-committee composed of A. W. Brady, C. D. Cass and C. W. Kellogg (representing H. G. Bradlee of the committee). No legislative action has been taken on this bill, but the subcommittee is giving attention to it with a view that, if finally passed, it shall be in such form as not to injure our companies.

The transportation act of 1920 has raised many questions involving various companies of the association, many of which have been disposed of by correspondence.

Just recently a question has been raised with the Public Utilities Commission of the District of Columbia by the Washington Railway & Electric Company insisting that that commission does not have jurisdiction over it regarding depreciation charges and accounts, but that, being an interstate carrier, it is, in such matters, subject only to the jurisdiction of the Interstate Commerce Commission, under the provisions of sub-section (5) of section 20 of the interstate commerce act, as amended by the transportation act of 1920 and has asked the co-operation of this committee in presenting the questions involved.

The determination of this question of jurisdiction is likely to prove a matter of great importance to many of our railway companies. As now pending, it is somewhat local in character, but

similar questions may arise, involving other companies, concerning the jurisdiction between state public service commissions and the Interstate Commerce Commission. The committee, therefore, feels that it should carefully look into all the questions involved and, after so doing, determine what should be its attitude concerning the same.

At the request of government officials connected with the work, this committee lent its aid in securing a proper appropriation to enable the Bureau of Standards to prosecute its field work on the subject of electrolysis, our association being represented on the joint committee acting with the Bureau of Standards in the investigation of this subject

The Washington office of the association, at 949 Munsey Building, has been under the management of the chairman of the committee. Paul W. McGovern has had immediate charge of the office, and has, in the absence of the chairman of this committee, transacted for the association a large amount of business. A résumé of the matters is then contained in the report, which was signed by Charles L. Henry, chairman, and Arthur W. Brady, Henry G. Bradlee, Britton I. Budd, Lucius S. Storrs, Edwin C. Faber, . C. L. S.. Tingley, C. D. Cass and W. S. Rodger.

The report on valuation was presented by Martin Schreiber, chairman. In conclusion Mr. Schreiber said that a large number of letters commenting on this report had been received and that most of these were complimentary. In a few cases some criticisms were raised, but when further explanation was made by the committee these objections were withdrawn. The report was approved as presented.

VALUATION

The committee during the year devoted its time to the two questions recommended for consideration at the last annual meeting, namely, "rate of return" and "economical procedure for appraisals."

Under rate of return the committee presented a general economic analysis to prove that a "fair return" must be allowed or guaranteed This "fair return" is not determinable in advance, but is a function of the variable conditions in each case.

In approaching the general question of the rate of return which should be allowed to a public utility the committee discussed the factors affecting the flow of capital into any given line of business. It pointed out the fluctuations of capital flow as dependent on production, competition and profits. The committee pointed out then that, left to itself, business is regulated not so much by competition for customers as it is by competition for capital. If prices are excessive in comparison with cost, capital flows in and lowers them; if prices are low in comparison with cost, capital refuses to flow in and even flows out until the shortage of production brings about an increase in price.

The committee then proceeded to discuss the control of monopolies, shawing that there is a dual standard for controlling monopolies, some being controlled by economic laws alone, while "public utilities operating under economic law, are put also under the direction and control of public utility commissions, which fix maximum rates for the product which these utilities offer for sale."

The committee then argued that there is no justification for the "exceptional treatment of public utilities," but concludes: "The committee would offer no protest against the regulation of the public utility. It is pointing out merely that the attempt to confine regulation of price to public utilities as a class has neither a historical nor a logical foundation."

A commission may desire to allow a satisfactory return, but its mere allowance of a return which it deems sufficient may not attract capital. The investor's mind determines whether his money goes in or not, and the practical fact is that the community which offers reward below the standard of the owners of fluid capital will not continue to receive adequate public utility service. The committee then pointed out that a rate fixed below the standard set by the investing community naturally leads to overbonding on the part of the utility; this merely aggravates the stock-issuing difficulties and tightens up the financial situation.

The committee then analyzed the views of the common stockholder and shows what he must have, indicating the change in stock quotations in recent years due to the low rate of return realized.

In its conclusions the committee covered these same points in different language. It then makes perfectly clear that it did not desire this report to be considered as opposing regulation, *per se.*, but merely an attempt to point out the dangers confronting the industry and the civic communities served by the industry if the rate of return is not adequate; in other words, if the rate of return is not such that new and additional capital from new investors will readily flow into the industry.

Finally, the committee said: "By the phrase 'adequate rate of return' we mean a rate of return such as will encourage a reasonable inflow of new capital from new investors. If the rate of return allowed does not do this, it is unquestionably inadequate, and the communities served will suffer all out of proportion to any possible minor gain through temporary lower rate of fare, for over a period of years the industry can better serve any community, at a lower rate of fare, if given adequate money for improvements."

Under the heading "Economical Procedure for Appraisals" the committee showed how past detailed methods of valuation entail the expenditure of considerable time and money. It pointed out that the accuracy of these detailed methods is probably no greater than some more general method which would consider types of construction with minor variations as basis for making large units to price. In other words, if railways with good property records will get together with the authorities it should be possible to determine upon a certain number of "yardsticks" corresponding to the various classes of property shown on the company records, and these company records can be made the basis of the valuation, any objection to their use on the part of any interested parties being made by affording to these interested parties full opportunity for such check inspection of the property as will determine the accuracy and adequacy of the records in question.

The committee then proceeded to show what is meant by this, listing the following types: (a) Types of track, (b) types of overhead construction, (c) types of equipment, (d) types of buildings reduced to cubage, (e) types of bridge and culvert construction, (f) type of pavement and foundation, and other similar types.

The committee recognized a certain amount of error, but says this would be no greater than that accompanying present methods. To show that this plan has not been confined merely to theoretical discussion, it pointed to the determination of the cost of reproduction new of the physical property of the Connecticut Company used and useful for the public service, substantially along these lines. (See ELECTRIC RAILWAY JOURNAL, May 21, page 947 and May 28, page 985.) The committee concludes that the progress of the art is such that in all future appraisals member companies shall attempt to secure:

1. Series of conferences between all of the parties interested in the appraisal to the end that there shall be an agreement as to the methods to be followed in the making of the inventory and in pricing.

2. That this agreement should cover the adoption of a minimum number of "yardsticks" or types to the end that the inventory may be rendered as simple as is consistent with equity to both parties.

3. That the prices of these "yardsticks" should, so far as possible, be fixed by agreement between the interested parties, falling back upon detailed study of construction only in those cases where agreement proves impossible or records incomplete.

4. That, wherever possible, overheads and intangible value shall be determined in like manner by agreement, resting upon the records of other appraisals which have met with the approval of regulatory bodies and the courts, modified, in those cases where such modification is demanded, by local conditions and the experience of the conferees.

The committee recommended that the next year's committee continue the detailed study of the above recommendations upon economical procedure

for appraisals. The report is signed by Martin Schreiber, chairman; C. W. Gillespie, W. H. Sawyer, Williston Fish, J. H. Hanna, H. C. Anderson, Cecil F. Elmes and W. H. Maltbie.

Safety-Car Operation

The report of the committee on safety car operation was next presented by R. P. Stevens, chairman. The following is an abstract.

The committee feels that its inquiry should be limited to safety car operation as a matter of general company policy. It has considered the subject from the viewpoint of public opinion, legislation, commission regulation and labor relations. The committee suggests the uniform use of the term "safety car" to designate all types of car operated by one man and equipped with adequate safety devices. Cars of older types rebuilt for one-man operation but lacking adequate safety devices cannot properly be described as safety cars.

In August, 1921, there were 5,500 one-man cars in operation in the United States. Of this number 4,300 were standard safety cars and 1,200 were converted former two-man cars.

This number of safety cars and safety devices on the former two-man cars, as well as the double tracking, turnouts and carhouse facilities incident to operating this equipment, represent an investment by the electric railway companies of about $50,000,000.

Not a single negative reply was included in the 122 answers received to the question of the one-man safety car being satisfactory to the public as to both quality and safety of service, although four were doubtful. Furthermore, as to opposition by public bodies, either city or state, to one-man safety car operation there were at the date of this report but two such cases pending in the whole country.

As regards safety of operation, experience has shown that on the basis of carefully kept accident records the one-man safety car, equipped with the standard safety devices, shows fewer accidents, and a lower cost of settling accidents, per 1,000 car-miles than the average two-man cars. The following figures show the result of experience in 1920 with one-man safety cars by seventeen companies carrying 246,642,000 passengers in eleven different states:

	Type of Car		
	One-Man	Two-Man	Total
Total car-miles operated	19,727,000	17,406,000	37,133,000
Total passengers carried	113,777,000	132,865,000	246,642,000
Total accidents	7,282	9,406	16,688
Accidents per car, 10,000 miles	3.69	5.40	
Total cost accidents	$291,620	$279,920	
Average cost per 1,000 car-miles	$14.77	$16.06	
Decrease in accidents per 10,000 car-miles			31.7 per cent
Decrease in accidents per 100,000 passengers carried			9.6 per cent
Decrease in accidents cost per 1,000 car-miles			8.03 per cent

The success of one-man safety cars in improving the accident situation is particularly striking when viewed in connection with the rapid growth in vehicular street traffic during the last few years while the one-man safety cars were being introduced. The total number of automobiles in the United States has grown from 2,424,000 in 1916 to 7,904,000 in 1920, an increase in four years of 226 per cent.

One-man operation has also proved satisfactory from the operator's point of view. As one-man car operation was inaugurated by introducing only a few cars at a time, the normal labor turnover prevented any man from losing his job, and the trainmen like the job, not only because it pays more money but because the work is more interesting. A great deal also has been done to facilitate the performance of the operator's duties, such as the use of registering fare boxes, air-operated transfer registers, simplification of reports, sale of metal "tokens" or tickets off the cars, and turning in of transfers only twice daily.

Where the principle of one-man operation has been applied to large double-truck cars, with the installation of adequate safety devices, the car is fully as safe and satisfactory as the small, light-weight safety car. Experience shows that the large double-truck, one-man car has fewer accidents from collisions than the light safety car, because, with its greater weight, the operator does not feel like taking chances with it, nor do the drivers of motor vehicles have the contempt for its size that they do for the smaller vehicle. All but two of the fifty-four replies received on that subject state that double-truck cars can be run by one man with the same degree of safety as by two men.

As the rate of fare paid by the public must be sufficient to cover the cost of furnishing a street car ride, the public benefits from one-man operation because the labor cost is reduced. The employee benefits because he is able to earn a higher rate of pay with one-man operation.

There are now no laws on the statute book of any state prohibiting the oper-

The Banquet at the Ambassador Hotel

THE ASSOCIATION THIS YEAR REVIVED THE PRACTICE OF HOLDING A BANQUET AT ITS ANNUAL CONVENTIONS

ation of street cars with one man. Bills proposing to prohibit one-man operation have been defeated by the legislatures of eleven states. Fifteen state public service commissions have approved one-man car operation. Numberless cases of city action with regard to one-man car operation are on record. Perhaps the most striking is the case of Detroit. In this city in 1916 (before the advantages of one-man operation with the safety car were generally understood) the city passed an ordinance prohibiting the use of one-man cars in that city. As soon as the city of Detroit went into the street railway business, however, this ordinance was amended so as to permit of the use of one-man cars, and the city-owned lines placed an initial order for 200 standard one-man safety cars.

The overwhelming majority of electric railway companies, backed by every state legislature or commission that has acted on the matter, agree that the one-man safety car means better and more economical service to the public and a more interesting and higher paid job for the operator.

The report was submitted by R. P. Stevens, chairman; James P. Barnes, H. B. Flowers, W. H. Heulings, Jr., C. W. Kellogg and J. W. Passailaigue.

Discussion on Safety Cars

J. P. Barnes, Louisville, Ky., contributed to the discussion of one-man car operation by stating that at this stage of development of the electric railway industry the principle of safety car operation needs no defense and no propagandists. The safety car has made its way against all obstacles by sheer force of its intrinsic merits, and its further application to traffic problems becomes a matter of executive policy rather than of engineering data or operating rules.

Public opinion, like individual opinion, forms favorable conclusions from consideration of those things which are of direct advantage to the public, and is negative in that it is more quickly and deeply stirred by inconvenience than by convenience, by discomfort than by comfort and by self-interest than by altruism. All the signs and notices and all the newspaper advertisements that can be printed will not carry a conviction of comfort and convenience to the man whose feet are trod upon or whose fingers are pinched. With the introduction of safety car operation the advantages should be explained concisely and pointedly from the viewpoint of public comfort and convenience and the operation must be carried out so as to be a real fulfillment of the prediction of better things. The report of the committee says, "Cars of older types rebuilt for one-man operation but lacking adequate safety devices cannot properly be described as safety cars." This is not to say that every car should be equipped with all safety devices available, but that every car operated as a safety car and described as such to the public must be equipped with safety devices adequate to its territory. The final injunction of Mr. Barnes was:

"Operate real safety cars where safety cars are applicable; give adequate service, comfortable and convenient; let your service be, in short, of the quality you yourself expect from the lighting company, the water company and the telephone company. So, and not otherwise, will the safety car be a success with the public, a joy to the operator and a boon to the industry."

In discussing this report H. A. Mullet of the Milwaukee Electric Railway & Light Company said in part:

"Realizing the necessity of economies which are made possible through the operation of one-man cars and to avoid the opposition which frequently results in cities accustomed by long usage to double truck cars, it was thought expedient to secure for Milwaukee a one-man car conforming in general respects to the regulation safety car but of double truck type. A spacious platform, but without change in height above the rail as compared with the standard safety car or without a step between the body and platform floor, is provided. Separate entrance and exit doors selectively controlled and provided with a division rail to separate the flow of passengers are included.

"The aisle of the car is 28 in. The seats in the new Milwaukee car are 3 in. wider than in the standard safety car. Two seats only at the diagonal corners are longitudinal, the balance or twenty in number being of the cross-type. The longitudinal seats are effective in affording somewhat more passage space and are provided to avoid the congestion which exists in the front end of safety cars when operating under heavy traffic.

"It has long been the practice in Milwaukee to employ street fare collectors at heavy transfer points, and to allow this practice to be continued and applied to the new safety cars a device has been designed which makes it readily possible for the fare collector on the street through the use of a small lever carried with him to open the doors on the rear end of the car, thereby allowing passengers to board at the rear end while the car operator is receiving passengers at the forward end. The device has been worked out in a simple manner and is operating satisfactorily.

"The car complete weighs slightly less than twice the weight of a safety car and seats fifty-eight passengers, taking into account certain folding seats provided on the platform. It will be noted, therefore, that the weight of the car per seated passenger is approximately the same for the two types of cars.

"Transfers of the directional type are employed in Milwaukee. Four different colors representing the different directions are carried in a suitable holder which allows the operator to select the desired one without loss of time.

"To date, operation with one man per car has been commenced on but two lines, both being cross-town lines. One of these by reason of a stretch of single track is limited to a minimum of 7½ minutes headway. The other line is more representative and is being successfully operated at a schedule speed of 10.15 m.p.h., as compared with 10.38 before the crews were reduced from two to one man.

"During the month of August, the total passengers carried per car mile on the line which is double tracked for its entire length was 9.6, as compared with 9.63, the general average in the City of Milwaukee for the particular month. Checks made to determine the time of loading per passenger indicate that from 1¾ to 2¾ seconds are required per boarding passenger within a range of from twenty-five to five passengers, which is somewhat but not appreciably greater than the time required on the standard two-man car as heretofore operated in Milwaukee.

"The safety car as designed allows of its operation with either one or two man crews, and it has been possible therefore to operate these cars on certain portions of lines with two men crews while the balance of the routes running into the suburbs are handled by one man per car.

"The results of the operation of the double truck cars thus far accomplished are eminently satisfactory, and accordingly arrangements are being made for the extension of the one-man service to numerous cross town lines as well as others running through the more congested sections of the down town portion of the city."

H. H. Adams of the Chicago Surface lines described the sample single-truck safety car which had been built for his company and which was now in operation. The essential features of this car were described in the ELECTRIC RAILWAY JOURNAL for Jan. 22, 1921, page 173. Mr. Adams stated that his company was making further investigation in regard to the most suitable type of car for one man operation in Chicago, and with this in view they were now building in the company's shops a double truck car for one man operation. As at present arranged this car is 37 ft. 2 in. long, 8 ft. 6 in. wide, and will seat forty-five passengers. Separate entrance and exit openings with a longer platform will be provided with this double truck car the same as has been used for the single truck sample car.

W. J. Harvie, Auburn and Syracuse Electric Railway, commented on the definition of the term "safety car" as included in the committee's report and suggested that the word "special" be added so that the sentence would read "cars operated by one man and equipped with adequate special safety devices."

Martin Schreiber of the Public Service Railway of New Jersey said that the service which they had been obtaining from the standard type of safety car was generally satisfactory and that they had experienced no increase

in the number of accidents from this operation.

E. M. Walker, Terre Haute, Indianapolis & Eastern Traction Company, referred to the 100 per cent operation of safety cars on his system and stated that the industry now had reached such a stage that safety car operation need not be defended as its use has proved conclusively that this type of car is an efficient salesman of transportation.

L. H. Palmer, United Railways & Electric Company, Baltimore, described the new type of safety car with separate entrance and exit, ten of which are in service on this company's line. These cars were described in the ELECTRIC RAILWAY JOURNAL for Sept. 10, 1921, page 400. In concluding Mr. Palmer said that the greatest need for railways at present was to give the public the best service possible and that the officials of the electric railway in Baltimore felt that the so-called standard safety car fell somewhat short in providing a service entirely satisfactory to patrons. He voiced the sentiment that railway officials should not allow themselves to get into a single-track frame of mind in regard to safety car operation and that the changes which they had found necessary to make in the last order for safety cars in the way of separate entrance and exits would tend to make this type of car even more popular with the traveling public and thus provide a substantial impetus to the use of one-man operated cars everywhere.

D. P. Abercrombie, Connecticut Valley Street Railway, in discussing the report stated that his experience with the use of one-man cars extended over a very short period. His observations as to the use of converted one-man double-truck cars have forced him to the conclusion that on long runs, involving many rates of fare, the number of duties placed upon the individual operator becomes too great and the operator is not able to collect properly all revenue from passengers. On shorter runs, however, with a flat fare it seemed to him that this type of car had a substantial possibility. It is regrettable that it has not been possible under the Massachusetts regulations to operate this type of car before, as it involves a substantial saving in platform labor.

It may be possible with the proper fare-collecting device for one operator on multi-zone lines to do more than is possible if the operators use the Rooke register. The present system of fare collection opens up substantial loopholes for the constant rider to ride substantial distances on a minimum fare, and furthermore, presents opportunities for the passenger to ride longer distances than he pays for even through the use of identification checks. These observations were formed from only a limited experience with this type of car and are subject therefore to criticism by those who have had longer experience.

At the latter end of the session when the president called for "unfinished business," there was a short renewal of the discussion on the safety car and it is included here so that it will all be together.

W. H. Sawyer, East St. Louis, criticised the expression "so-called" standard safety car. He thought the industry had taken a big step forward in the design of the usual type of single entrance-and-exit car. H. H. Adams, however, declared that neither the association nor any of its affiliated associations had adopted any car as standard. R. P. Stevens declared the committee had no intention of establishing standards in its report, but it was prepared only to supply information. He expressed the opinion that all one-man double truck cars should be equipped with safety devices.

TERMINAL SERVICE POSSIBILITIES

J. R. Bibbins, manager department of transportation and communications U. S. Chamber of Commerce, then presented a paper on "Terminal Service Possibilities of the Electric Railways." This appears elsewhere in this issue.

In verbal explanation Mr. Bibbins explained that his paper might seem somewhat academic, but it was so prepared intentionally, partly because he wished to outline general principles and partly because many of those present were well able to make practical applications of the principles.

ADDRESS FROM SECRETARY HOOVER

President Gadsden than announced that about two weeks ago he with other representatives of the association had seen Secretary Hoover of the Department of Commerce and he had agreed to present an address at the convention if official duties did not keep him in Washington. Mr. Hoover had found that it was impossible for him to be present but he had sent his address, which would be presented by F. M. Feiker, assistant to the Secretary.

Mr. Feiker on being introduced said that Mr. Hoover had expressed great interest in the problems of the electric railways. It is the philosophy in the Commerce Department for the Government not to do business in place of business men but for business men, and to utilize as far as possible the collective activities of men or groups of men in promoting industrial prosperity. He also explained that Mr. Hoover had personally taken a great deal of interest in preparing this address, which was written during one of his weekly single-day boat trips. He then read the address, which is published elsewhere in this issue.

RESOLUTIONS

The report of the resolutions committee was then presented by Mr. Bozell. The resolutions, which were unanimously adopted, follow:

SERVICE BY MR. GADSDEN

Whereas, Philip H. Gadsden, called in a time of peculiar need, has served the association as its president for the past year in a remarkable manner of usefulness and service to the industry and the association, and

Whereas, Mr. Gadsden has given unstintingly of his time and thoughts to the difficult problems of association organization and operation during the year, and

Whereas, Mr. Gadsden has in addition given a special and immeasurable service to the industry through his constant willingness and ability to present in public in many and various places in the country the peculiar problems of the industry, therefore,

Be it resolved, that the association hereby record its deep appreciation of the extraordinary service Mr. Gadsden has rendered and extend its sincere thanks and indicate its obligation to him.

TRIBUTE TO OFFICERS

Whereas, the past year has been one which, for several special reasons, has demanded extra and extraordinary service on the part of the officers of the association, and

Whereas, they have given unsparingly of their time and thought in the effort to have the association perform its proper function and prove of greater usefulness to the industry, now therefore,

Be it resolved, that the association express its appreciation and thanks to the officers for this service.

DEATH OF MR. LANDERS

Whereas, the association has learned with deep regret of the death of J. J. Landers, auditor of the York Railways, president of the American Electric Railway Accountants' Association, and a member of the executive committee of the association, and

Whereas, Mr. Landers was a man of sterling character and high purpose and served this association and its affiliated association in a spirit of true service.

Be it hereby resolved, that, we do record our appreciation of his worth and service and our sorrow at his loss from our midst.

DEATH OF MR. LITTELL

Whereas, the association has heard of the death, last spring, of Hardin H. Littell, one of the organizers of this association and the first president of the association, and

Whereas, we recognize the debt the industry and the association owe Mr. Littell for his early constructive work, and

Whereas, Mr. Littell was known to be by all his friends a man of courage, ability and accomplishment, a man of character and a loyal friend, therefore,

Be it resolved, that we do record our appreciation of his service to the industry, of his worth and of our sorrow at his loss from our midst.

DEATH OF MR. WRIGHT

Whereas, the association has heard with deep regret of the sudden death of Thomas A. Wright, vice-president and general manager of the Wilkes-Barre Railway Company, and

Whereas, Mr. Wright was a man of strong personality, quiet and courageous, a genial companion and a warm and loyal friend, now, therefore,

Be it resolved, that we record our appreciation of his worth and our sorrow at his loss from our midst.

TO THE SPEAKERS

Whereas, during this convention of the association, we have had the pleasure and benefit of having addresses presented to it by men outside of its membership, and

Whereas, these addresses have been of very great value to the association in its deliberations, now, therefore,

Be it resolved, that the thanks of the association be extended to Dr. J. Duncan Spaeth and Messrs. H. M. Addinsell, F. E. Frothingham, J. K. Newman, J. R. Bibbins and R. H. Babson.

TO MR. HOOVER AND MR. FEIKER

Whereas, the Secretary of Commerce of the United States, Herbert Hoover, though overloaded with the pressing problems of his office, particularly the unemployment situation and the condition of dislocated industry of national importance, has nevertheless recognized the importance of the electric railway industry and its problems, and

Whereas, Mr. Hoover has prepared a message to the association and has sent his personal representative, F. M. Feiker,

assistant to the Secretary, to present the message in person, therefore,

Be it resolved, that we express our appreciation to Mr. Hoover for his message and to Mr. Feiker for his personal presentation.

SUPPORT OF TECHNICAL PRESS

Whereas, the association recognizes th value in any field of a strong technical press and the close interdependence of interest of an industry with the technical and business papers which serve it, therefore,

Be it resolved, that the association express its appreciation of the excellent service to and support of the industry and association rendered by papers in the electric railway field.

President Gadsden then stated that the time had arrived to lay down the gavel and he appointed a committee to escort the new officers of the association to the platform. All were present with the exception of Mr. Emmons.

Mr. Todd expressed his appreciation of the honor accorded to him and pledged his best efforts in behalf of the association. Mr. Budd urged a more general adoption of the policies recommended by the association, and said he referred particularly to the organization of safety committees. Mr. Shannahan urged the co-operation of all during the coming year and Mr. Coates emphasized this need by two stories.

President Todd, after saying that the reports scheduled for Monday morning but not presented would be placed on record, declared the meeting adjourned. Abstracts of these reports follow:

COMMITTEE OF ONE HUNDRED

In accordance with action taken at the 1920 convention, the Committee of One Hundred, with slight changes in personnel, has continued to function for the purpose of disseminating general information regarding the industry. This publicity and educational work has been carried on through cooperation of the Committee of One Hundred and the American Electric Railway Association, being under the direct supervision of the committee on publicity with the general approval of this committee.

The committee planned a dinner in New York City on July 8, 1921, in commemoration of its second anniversary, but it was postponed due to the impossibility of securing the desired speakers at that time. It is expected that this dinner will be held some time during this fall or winter. What the committee has in mind for the future has to do more particularly with matters affecting credit. Your committee feels that however good the results may be from local effort, the results in improving the credit of electric railway companies will not be so good unless this national campaign is carried on. The report was submitted by Henry R. Hayes, secretary and treasurer.

REPORT OF COMMITTEE ON COMPANY SECTIONS AND INDIVIDUAL MEMBERSHIP

Martin Schreiber, chairman, presented the report of the committee on company sections as follows:

There was only one company section of the association formed this year This, however, does not represent the full activities of the company section movement. At present individual members of the association number only about 830; while the company section individual members are nearly three times that number. So the company section idea is largely responsible for the individual memberships of the association.

If it had not been for the company sections during the past few years the record of the individual members would be rather a disappointing one. Now, it is generally considered that the possibilities of the American Electric Railway Association or any other body made up of individuals largely depends on its personnel, and since the company section is the strongest influence for increasing the efficiency and number of individuals identified with our association, why don't our member companies take more interest in organizing company sections?

F. G. Buffe, general manager for the receiver of the Kansas City Railways, says: "There is a broad field to cover in association work and that is the development of company sections. There is an opportunity in bringing to the army of electric railway employees the advantages of this co-operative work. Our organizations will best progress with the education of our minor officials, and through company sections this can be accomplished. We should all strive to make every employee of every street railway system in the United States an interested participant, feeling that he is a part of this gigantic combination of capital and labor, united for the public service."

The company section referred to as instituted this year is Section 13 of the association. It comprises the employees of the southern division of the Public Service Railway, Camden, N. J. This section was created and in operation in about one week after it was decided to go ahead and more than 200 members are enrolled.

It has been operating for less than a year but has quite a unique record. The monthly meetings of this section are not only an open forum for the rank and file of the company, but also for the public as well. To get a true view of the car riders, instead of an interpretation, often initiated by the company's mutual admiration society, prominent representatives of the public are invited to address the company men at the section meetings. Already the president of the City Council, the secretary of the Chamber of Commerce, president of the Rotary Club and the City Attorney have appeared at these meetings. In this way, these people are given a chance to talk directly to the persons who are really responsible, at least as far as the car rider can see, for the operation of the railway. If experience is any criterion, the experiment has been very satisfactory to all concerned.

Your committee does not intend to go into detail about a particular company section when such splendid work is being done by other company sections, such as those of the Community Traction Company, Connecticut Company, Chicago Elevated Railways, Newport News & Hampton Railway and others. But the committee mentions the work at Camden because it seems to be rather a new departure.

When officials go back to the job, the committee recommends they give the company section idea honest and sincere consideration. We believe that each one of you who does this will start a company section at the earliest possible time. Moreover, you will accomplish for your own company what Mr. Buffe has pointed out as well as give an impetus to the association that will put it in the position which it rightfully deserves. The members of the committee stand ready to render any aid that they can in the organization work.

REPORT OF JOINT COMMITTEE OF NATIONAL UTILITY ASSOCIATIONS

The joint committee of National Utility Associations was organized as the result of the belief that matters of a national character bearing equally upon and having the same relation to all utilities could be more effectively handled and confliction of effort avoided by a central conmmittee representing equally and impartially the three national associations most directly concerned. Preliminary discussions of the matter resulted in an organization meeting in the headquarters of the National Electric Light Association on Dec. 22, 1920, at which Randal Morgan was elected as temporary chairman by the representatives of the American Electric Railway Association, National Electric Light Association and American Gas Association.

The permanent officers elected at this meeting are: Randal Morgan, chairman; S. Z. Mitchell, vice-chairman, and O. H. Fogg, secretary. The executive committee members are: S. Z. Mitchell, chairman; P. H. Gadsden, vice-chairman, and O. H. Fogg, secretary.

Among the several sub-committees appointed that on taxation has been the most active, W. V. Hill having been temporarily retained to represent it in Washington. This committee has had under frequent advisement the various phases of federal taxation as they relate to public utilities and its chairman and representatives have presented the views of the committee before various governmental committees and officials. Its sub-committee appointed to confer with representatives of the Association of Railway Executives has had several meetings with representatives of that association. A sub-committee on fuel, of which J. W. Lieb is chairman, has been actively carrying on the activities formerly conducted by the National Committee on Gas and Electric Service in so far as they relate to the supply of fuel for the use of public utility companies.

A third meeting of the joint committee was held in the office of Mr. Mitchell, president Electric Bond & Share Company, Sept. 21. The question

of tax-exempt securities and the constitutional amendment was discussed and the possibility of providing a modification of the present law. The National Tax Association has passed a resolution against tax-exempt securities.

Mr. Hill has also prepared a report on federal tax revision, a copy of which is attached as part of this report. It follows:

FEDERAL TAX REVISION

The sub-committee on federal taxation of the joint committee of public utilities associations consists of the following members: Philip H. Gadsden, chairman; Charles A. Munroe, Henry G. Bradlee, Frank W. Frueauff, R. A. Carter and Oscar E. Fogg, secretary.

While a report on the work of the committee on taxation at this time is somewhat premature, the tax revision bill having only passed the House, and at present being considered by the Senate finance committee, it may be of interest to some to know what has been done, and what is proposed by the committee.

Mr. Gadsden appeared before the Senate finance committee on May 10 last, during the consideration of a sales tax bill, urging against the levying of a sales or turnover tax on car fares, gas, electric light bills or meters, explaining the reasons for his objections; in fact, opposing a sales or turnover tax on regulated industry. He stated, however, that he favored a sales or turnover tax with the above exceptions. The finance committee subsequently placed the proposed sales tax bill in the discard.

Mr. Gadsden injected in his statement before the committee strong opposition to the continued issuance of tax-exempt securities by municipal, state and federal governments, calling attention to the serious effect this practice was having on public utilities securities competing in the open market with them and the effect on business in general. He also stated that he favored the repealing of the higher brackets on surtaxes and the excess profits tax.

The tax committee, realizing the increasingly adverse effect that the continued practice of issuing tax-exempt securities, especially by states and lesser subdivisions, was having on public utilities securities, as well as other taxable securities, started an educational publicity campaign and through the cooperation of the three national public utility associations, bankers, farmers, associations and others interested, a strong public sentiment has been developed in favor of immediate legislation to correct the evil. Unfortunately, however, legal authorities, in and out of Congress, who have made a study of the question, have concluded that the only remedy is through the enactment of a constitutional amendment, which cannot become effective until ratified by the legislatures of three-fourths of the states. Bills have been introduced by influential members in both houses of Congress to correct this situation, and a majority of the congressmen favor this legislation.

Also the ways and means committee prepared, approved and submitted on the floor of the House an amendment to the revenue revision bill, which would create a temporary commission to be appointed by the President, consisting of members of both Houses and the public, to study the situation and report within a year its findings and recommendations on this question. The amendment, owing to lack of sufficient time, was caught in the jam just before final vote was taken on the bill and was not adopted. We have assurances, however, that the Senate finance committee will embody it in the bill in that committee.

The ways and means committee of the House held four days hearings on the general tax revision bill. Mr. Gadsden was scheduled to appear on behalf of the tax committee on July 28, but at the last moment an urgent business engagement prevented, and the writer was asked to appear in his stead, making a short statement and filing with the committee a brief prepared by Mr. Gadsden. General publicity was given Mr. Gadsden's statement through the association's service letters and magazines; also other technical journals and the press. The Philadelphia *Public Ledger* printed a strong editorial indorsing Mr. Gadsden's views.

Mr. Gadsden advocated in his statement that public utilities be placed in a special class for the purpose of taxation, setting forth the reasons therefor. He protested against any increase in the normal income tax on gas, electric railway and electric light and power companies. He urged that normal income tax on public utilities be retained as at present at 10 per cent, giving reasons why this distinction should be made. He protested against a tax on undistributed income upon public utilities, and urged legislation to stop issuance of tax-exempt securities, and the repeal of the higher surtaxes and excess profits taxes, showing in detail the adverse effect these taxes have on public utilities.

The writer in his statement before the ways and means committee touched upon the proposed increase in normal income tax and undistributed income and the effect of these taxes on public utilities, and also urged that the committee give consideration to extending the tax exemption of 42 cents on one-way fares to one dollar, if it did not contemplate repealing all of the transportation tax at this time, explaining the reasons for this change.

The tax committee, through Mr. Gadsden, endeavored to get a hearing before the Senate finance committee to again urge a separate classification for public utilities for the income tax levy and also the repeal of the capital stock tax on public utilities, but Senator Penrose, chairman, advised us that no further hearings would be held, but we could file supplementary information and it would receive the careful attention of his committee. The tax committee will continue to watch the situation carefully as it develops in the Senate finance committee and until final enactment of the bill, and will endeavor to carry out the program as outlined by Mr. Gadsden. The committee asks for the continued co-operation of all interested in this important work.

Entertainment Features at the Convention

NOTWITHSTANDING the heavy business program of the convention a very pleasing entertainment program was provided for the delegates. It began with a golf tournament, at which O. A. Broten, National Pneumatic Company, won the kickers' handicap and L. A. Wilson, Ohio Brass Company, won low gross. The low net for the supply men was won by R. Wilson of the Westinghouse Electric & Manufacturing Company and for the railway men by G. T. Seely of Youngstown. The tournament between the railway and the supply men was won by the latter by a score of 7 to 1, there being eight players on each side.

Rain proved to be such a formidable obstacle that the ladies' obstacle golf game scheduled for Monday afternoon on the links of the Marlborough-Blenheim Hotel was canceled. The weather the rest of the week, however, was ideal. On Monday evening, the annual reception was held in the Venetion Ballroom of the Ambassador Hotel. In addition to the dancing, which continued into the early hours of the morning, an aquatic exhibition was provided by a number of expert men and girl swimmers for the entertainment of those who cared more for this than dancing. Included in the aquatic exhibition was a water polo contest engaged in by members of the association. The game was not finished as the ball mysteriously disappeared. The reception was enlivened by novelty features and professional dancing.

On Tuesday the ladies enjoyed an afternoon tea in the Japanese Tea Room of the Ambassador and music by the Special Ambassador Orchestra. The association dinner, made more pleasant by the presence of the ladies, was an innovation in the convention program and was generally pronounced a great success. Dancing followed the banquet.

Wednesday afternoon the ladies indulged in a bridge tournament at the Ritz-Carlton Hotel and in the evening there was a grand ball in the Renaissance Room of the Ambassador. Another informal tea, in the Trellis Room of the Ritz-Carlton, with music by Veschey's Parisian Band, formed the afternoon entertainment for the ladies on Thursday. The convention concluded with a theater party that evening, at which the delegates were entertained by Ed Wynn in "A Perfect Fool."

A large committee, under the direction of Chairman Edwin C. Faber, was responsible for the elaborate and highly successful entertainment program provided.

Engineering Association Proceedings

W. G. GOVE
Retiring President

Engineers Held Five Busy Sessions at Which Experts from Outside the Association Were Heard—Unusual Amount of Prepared Discussion Followed Presentation of Reports—C. S. Kimball Elected President—Retiring President Gove Suggested a Committee to Study Possible Improvements in Organization

CHARLES S. KIMBALL
Newly Elected President

PRESIDENT W. G. GOVE opened the convention of the American Electric Railway Engineering Association on the afternoon of Oct. 3 in the Solarium of Haddon Hall. The first number on the program was the reading of the presidential address by Mr. Gove. An abstract of this follows:

MR. GOVE RECOMMENDS SOME REVISION OF ASSOCIATION PROCEDURE

This convention marks the end of the eighteenth year of the existence of this association, under one name or another, as an independent association or one affiliated with the American Electric Railway Association. It is incredible that changes cannot be made in its constitution and procedure that would greatly enhance the standing of the association and the value of its work. As in every other industry, the experience of the past is of value in shaping the course for the future, but it is not a safe or proper guide as to just what should be done. New methods must be found; modern ways of obtaining more efficient and prompter results should be devised.

The American Electric Railway Association has found it desirable to appoint a reorganization committee, with a view to modernizing and increasing the efficiency of its organization. Similarly this association should take up the work of reorganization. The time is now ripe for the appointment of a reorganization committee by the incoming president, to report the results of its work to the executive committee as early in 1922 as possible. I wish, therefore, to make an earnest presentation of facts as I see them with the recommendation that the association inaugurate promptly certain reforms and changes. These could not but be beneficial and would be consistent with the action recently taken by associations similar to this.

Following are some of the things that, I think, the association should do.

1. Definite recommendations have been made by the reorganization committee of the American Association, which include several features that are deserving of very careful consideration by those charged with the responsibility of shaping the destinies of the American Electric Railway Engineering Association.

To the extent that the American Association exercises supervision of this association and its organization, including provision for financing its work, and continues the present policy of denying the Engineering Association an adequate appropriation for carrying along its research and committee work, the results which can be expected are limited. The policy of paying none of the expenses of standing (or working) committees, and depending entirely upon the generosity, enthusiasm or ability of member companies to pay the expenses of its employees when engaged on committee work is a restriction that cannot but militate against the value of the results finally obtained.

As a further item of direct interest to the association, it will be noted that the reorganization committee of the American Association has recommended the continuance of *Aera*. This has been a matter discussed for some years, and there is wide divergence of opinion as to its value. Inasmuch as it is likely to be continued, however, I appreciate that the magazine can be made use of by your association in reporting proceedings, or as a means of obtaining more widespread discussion of committee work. Publication of such reports should be made from time to time, and the final report of the committee should be printed previous to the convention. Under the present procedure I see no advantage that accrues to the Engineering Association. Furthermore, there is the Question Box, which occupies space and incurs expense that could be better devoted to the interests of the Engineering Association. This would aid the association in taking its proper place among the national engineering associations.

SIMPLIFICATION OF COMMITTEE WORK

2. The carrying along of work from year to year by means of standing committees has accomplished some results. If, however, the industry at large is to be greatly benefited by current rather than "post-mortem" action, there needs to be a radical change in the methods pursued in carrying on research work. All committees should, so far as possible, be equally divided in membership between engineering representatives of manufacturers and railroad operating engineers. Committees today are altogether too large, and have too many subjects assigned to them. Due to the financial policy already mentioned, about 85 per cent of the committee work done in accordance with the yearly assignment of subjects is performed by comparatively few men from a few Eastern cities. Many of those appointed take little interest in the work. Even if the very considerable financial obstacle to the proper accomplishment of committee work cannot be immediately removed, much can be done by organizing committees to represent more nearly the various sections of the United States. Discussion, even through the mail, should insure wider discussion of recommendations than at present, and the representation of the views of a larger section of the country. Subjects should be very carefully considered some months in advance of the convention and only a few of them assigned to each committee.

As a member of the American Society of Civil Engineers, I was greatly impressed by an address of Edward J. Mehren, editor of *Engineering News-Record*, delivered at that association's headquarters on Jan. 5, 1921. He summarized present industrial and political conditions in western Europe and Germany, the particular feature of interest to the Engineering Association being his reference to "standardization or direction of design." While standardization is of the greatest importance, it will never be fully effected. In fact, if carried too far it will retard rather than develop an art. While the work of the standing committees has done much in this field, an equal amount, or more, could be accomplished if certain consideration in the matter of design were given in advance. For

instance, in connection with rolling stock we have all agreed that a universal application of a standard car is out of the question, but it should be entirely possible, and would be of considerable economic value, to have standard types of cars. Today the safety, or one-man, car most nearly approaches this condition, although there is already a disposition seriously to criticise this type. Premiums or penalties in the form of an increased first cost are paid to obtain something special to meet either assumed or real "local conditions."

To offset this, closer co-operation in advance of production by the manufacturer and with the railway engineer might be carried along with the aid of an advisory committee. This should be restricted in number, but should, like other committees, include an equal number of manufacturing and operating engineers. Among the latter should be a civil, a mechanical, and an electrical engineer. The committee should function separately from the standards committee and should have a secretary-engineer as its nominal head. There need be no restriction as to the number of types of cars. The list could include buses, for instance.

The standardization by types is an economic necessity at a time when the industry is struggling to find means of producing increased efficiency and economy and when it is highly probable that trackless trolleys and buses will be added to the equipment of public service utilities. Why should not careful consideration be given to standardization in the development of such vehicles rather than leave them for "post-mortem" consideration?

Who Should Vote on the Equipment Standards?

3. Voting upon standards at present is done on a wrong basis, as can be seen by a simple illustration. Take the case of rolled steel wheels regarding which a company operating a few cars with cast-iron wheels has as much to say as one operating 50,000 rolled steel wheels. The cast-iron wheel user can criticise the steel wheels and share in determining the characteristics of the steel wheels. Voting upon standards should follow the long-established practice of the Master Mechanics' and Master Car Builders' Associations, now the mechanical division of the American Railway Association. There standards bearing upon rolling stock are voted for upon a unit basis, the company voting the number of cars owned. In power generation, line distribution and affiliated matters, kilowatt output for railway purposes, should govern. So also should the number of single-track miles operated in all way and structure matters. For manufacturer members a unit based upon gross sales could be worked out. Perhaps in both cases only those directly concerned with the subject at issue should vote.

4. A permanent organization should be provided by having a paid head of marked ability. It is all right to elect a president each year, if desired, as at present, but there should be a secretary-engineer, who would be the nominal head of the Engineering Association in all matters excepting those having to do with direct administration and policy. These, of course, rest now and should continue to rest with the executive committee. Thus continuity of action from time to time could be assured. The technical correspondence and the co-ordination of all committee work could be carried along from year to year, regardless of changes in the office of president, or changes within the executive committee. Such a plan would only be consistent with the practice of such national associations as the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers and others of national importance.

As to the Improvements in the Engineering Manual

5. The *Engineering Manual* is the record of committee determinations and findings. It should bear to the association and the industry at large much the same relation as does "Kent's Handbook" to the mechanical engineer and "Trautwine" to the civil engineer. The *Engineering Manual* is valuable, but from time to time questions have arisen as to its being in proper form; also as to the method of binding, providing for additional copies in whole or in part, and other pertinent questions. I recommend that this matter be made a part of the work of the proposed reorganization committee so that it may be determined in a manner consistent with up-to-date methods and practices.

Co-operation With American Engineering Standards Committee

The association has taken a progressive step in obtaining representation in the American Engineering Standards Committee. This organization is comprised of representatives of leading engineering, railway and other associations, and has the object of unifying methods and promulgating rules for developing standards. The literal carrying out of such a purpose would undoubtedly be of very considerable value to the electric railway industry. But until the organizaton of the association provides for more active research work throughout the entire industry this purpose cannot be fully accomplished as far as the electric railway industry is concerned.

In submitting these suggestions I realize that they will not meet with universal approval. It is always easier to continue doing what has been done than to make somewhat radical changes in methods. However, there never was a period when changes could be made to greater advantage than now, and there are comparatively few matters that can properly be carried along in the same way as was the practice but a few years ago. My object in making these recommendations is only to suggest ways of giving the association a higher standing among the other national engineering associations to which foreign countries are looking for engineering progress. I trust that such changes can be made as will, in the end, render more valuable the results of the committee work as embodied in the Engineering Manual.

Secretary Welsh Reports

Secretary J. W. Welsh then presented the report of the executive committee. This, he said consisted of the minutes of the committee meetings for the year. It was accepted without reading, for publication in the proceedings.

Mr. Welsh also read his report as secretary. He gave statistics of the attendance at committee meetings, showing a very high average attendance. He also explained the ways in which the association is co-operating with the American Engineering Standards Committee. He gave as the present membership the following: individual members, 533; company section members, 451; total 984. The report of the secretary was accepted.

The next business was the appointment of a committee on resolutions as follows: H. H. Norris, H. H. George and R. H. Dalgleish.

Report on Apprentice Systems Presented

The report of the committee on apprentice systems was next read by F. R. Phillips, chairman. An abstract follows:

Apprenticeship Systems

The scope of the duties assigned to the committee on apprenticeship systems proved to be so great that it was able to submit only a suggested outline this year to serve as the foundation for a plan of apprenticeship training which may later be adopted by the association.

After a report upon the apprentice work being done by various organizations, including the Paris-Orleans Railway of France, a plan was outlined which follows steam railroad models, modified to suit the peculiar requirements of the electric railway business. This plan, in the committee's opinion, offers the best means by which the industry may secure recruits for its personnel.

The plan comprehends two sections: (1) A trade apprenticeship course, and (2) an engineering apprenticeship course.

The trade apprenticeship course provides for four years of continuous service in one trade, with accompanying classroom instruction. The classroom instruction would consist of two periods per week throughout the entire four years of apprenticeship, each of two hours duration. A summary of the curriculum follows:

First year, mechanical drawing and blueprint reading, two-thirds of time; practical shop arithmetic, remaining time.

Second year, mechanical drawing and study of elementary mechanism, half time; remaining half of time to be devoted to study of tool designs, shop practice, etc.

Third year, study of general principles of electricity, electrical devices and machines, half time; other half to be devoted to further study of problems connected with the apprentice's particular trade.

Fourth year, details of electrical mechanical equipment used on cars of the company, half time; remaining time to be devoted to instruction in the rules and regulations of federal, state and municipal bodies relating to the company's cars, and some instruction in elementary economics as applied to the company's business and everyday life of the apprentice.

It was the committee's opinion that for the developing of engineering apprentices some form of the co-operative training such as was originally inaugurated by the University of Cincinnati, and introduced later by the University of Pittsburgh and seventy other educational institutions more or less, would be most economical and satisfactory.

This report was signed by F. R. Phillips, chairman; L. C. Datz and H. A. Johnson.

Discussion on Apprentice Systems

Following the presentation of the report, prepared contributions to the discussion were presented by H. W. Cope, Westinghouse Electric & Manufacturing Company; E. P. Roundy, New York State Railways, and E. P. Waller, General Electric Company.

Mr. Cope said that the steam railroads and the large manufacturers had found a course of training for their young men to be indispensable, and he believed it possible for the electric railways to use a modified form of the apprenticeship system adopted by the steam railroads. He believed it desirable to work out more than one plan, owing to the differences among properties, due to size and environment. Some properties are so located that apprentices could attend classes at colleges or universities, while apprentices on other properties might take correspondence courses.

Mr. Cope suggested the organization, at association headquarters, of the proper personnel to guide this activity while in a formative state. He also suggested that the period of four years required to complete an apprenticeship course is too long. A shorter period of intensive training proved its effectiveness during the war.

In addition to a study of economics Mr. Cope suggested that the course might include the study of public relations. It is also very important that the men be rightly chosen at the start in order that time and money be saved by not trying to train misfits. He listed six subjects for consideration by the committee, *i.e.*, (1) a special one-year course for college graduates; (2) more mathematics for trades apprenticeship courses; (3) a reduction of the age limit; (4) systematic scheduling of students through the various departments; (5) the making of an agreement under which both parties will have to make good; (6) the placing of the apprenticeship wage rate at a fixed percentage of the standard journeyman rate.

Mr. Roundy said that the report covers the ground very well, and from one of the plans described a system can be devised which will apply to electric railways. As it is the province of the colleges to give the necessary technical training it is not advisable for the electric railways to provide this. However, a young man attending college might be given four months of work each summer with an electric railway. Mr. Roundy believed the idea to be erroneous that a knowledge of the financial condition of the industry keeps college men away.

In the training of mechanics and tradesmen, Mr. Roundy said that technical training should be carried just far enough so that the mechanic understands the reason for doing the work as he is taught to do it. If he shows qualifications for foremanship the technical training may be continued. Technical training of foremen should not overlap that of the apprenticeship engineer.

Mr. Waller said that the apprentices of his company are taught shop trades and not engineering. The training given technical graduates is not an apprenticeship course. Most shop courses cover four years, but high-school graduates are given special credit for their school work, and this may amount to a reduction of one year in the apprenticeship course. Class work averages four hours a week. Classes are held in shop time and apprentices are paid their regular rate during class periods. Those who drop behind in their studies go into the school room on full time without pay until they catch up.

Mr. Waller said that in most cases the students spend from six months to a year in the training room and are then rotated through the shop departments. They remain on the payroll of the apprentice department, however, and regular reports are rendered by the shop. This prevents favoritism. Graduates from the course are given a diploma and a bonus of $100; and receive preference in shop promotions, other things being equal.

Mr. Waller believed it inadvisable to specify a definite ratio of shop apprentices to shop mechanics, as in some localities this might cause labor troubles. He also thought that the suggested course lacks mathematics, but in other respects it seems to be comprehensive. Mr. Waller referred to a booklet on shop apprenticeship system prepared by his company and which he recommended for reference by electric railway companies.

After the above discussion, L. C. Datz, American Cities Company, chairman of the committee on subjects, inaugurated a new procedure by reading the tentative assignment made by his committee immediately after the conclusion of discussion on the particular report.

Heavy Traction Report Presented

An abstract of the report of the committee on heavy traction was read by the chairman, Sidney Withington, New York, New Haven & Hartford Railroad. An abstract of this is given below.

Heavy Electric Traction

A new feature of the report of the committee on heavy electric traction this year was a summary of the activities of other associations in the study of heavy traction matters. In this way the committee endeavored to coordinate the work of the American Railway Engineering Association, the International Railway Congress, the American Railway Association Mechanical Section, the American Institute of Electrical Engineers and the Association of Railway Electrical Engineers, in so far as this can be done by bringing the attention of the readers of the report to the work of these associations.

The outstanding features of the report this year were the compilation of data on electric locomotives and multiple-unit equipment and the bibliography of heavy traction literature. Complete data were included for electric locomotives of North and South America weighing more than 80 tons. Promise of similar data for European electrification was made for the future. A table is included giving the facts regarding multiple-unit trains practice for twenty railway companies in North America.

The electric locomotive data table contains forty items for each locomotive, including weights, dimensions, fundamental operating data and facts as to dates, manufacturers, etc. Accompanying the table was a chart of steam track mileage electrified and corresponding electric locomotive tonnage, showing that between 1905 and 1920 electrification was proceeding at the rate of 180 miles of track and 36,000 tons of locomotives per annum. There was a reasonably uniform relation between these two quantities, the average, of course, being 200 locomotive-tons per mile of track. No increase in trackage or tonnage was noted for 1920.

The table of data for multiple-unit trains of North America in heavy service contained twenty-four items and covered both electrified steam railroads and rapid transit lines in large cities. As to multiple-unit operation, the committee reported that in suburban electrification of railroads the application of multiple-unit equipment results in certain advantages as compared to electric locomotives, which may be summarized as follows:

The long heavy multiple-unit train accelerates more quickly than the train of the same weight hauled by a locomotive.

In a multiple-unit train the motor equipment is varied to correspond to the length of the train, and thus is often more efficiently used than in the electric locomotive.

The reliability of operation of multiple-unit equipment is somewhat greater than that of electric locomotive equipment.

The multiple-unit cars, being heated electrically in winter, are free from all difficulty connected with oil-burning steam boilers, and although the cost of power thus used in heating may be considerable, this convenience of operation is valuable.

Perhaps the most important advantage of multiple-unit equipment is in switching, especially in crowded stub-end terminals. Locomotive-drawn trains, after arrival at the terminal, must be backed out to free the locomotive. This extra double move is often necessary when the terminal tracks are most congested. The multiple-unit train, on the other hand, is ready for the return trip practically as soon as it has reached the terminal.

There are some limitations, however, to multiple-unit operation as compared with electric locomotives. Multiple-unit cars in general can be operated economically only over tracks equipped with energized third rail or trolley (although occasionally this type of equipment is hauled outside the electric zone by steam locomotives for short distances). The result is that the cars are not available for duty outside the electrified territory in the event of a local heavy traffic demand elsewhere.

The mileage of multiple-unit motor equipment is often less than that of an equivalent electric locomotive, on account of traffic limitations.

The maintenance, reduced to a seat-mile basis, is usually higher with multiple-unit equipment than in the case of electric locomotives and standard trailer coaches.

The decision between multiple-unit and locomotive equipment in each individual case is governed by local considerations. The excess cost of multiple-unit car maintenance is often offset by the saving made possible in terminal tracks on account of elimination of switching requirements. In general, it may be said that each type of equipment has its definite place in the heavy traction field.

In the design of multiple-unit equipment there is some question as to the relative advantages of trains made up of old motor cars as compared with motor cars and trailers. This question involves careful study of equipment, as well as terminal characteristics. One railroad which started electric operation with mixed motor car and trailer trains has since equipped all cars with motors, while another railroad, which started operation with all motor cars, has revised the initial policy by acquiring trailers.

The report concludes with a 104-page bibliography on heavy electric traction which was compiled with the co-operation of the association of railway electrical engineers. This covers all topics related to the rolling stock, track, power distribution, operation, economics, etc.

This report was signed by Sidney Withington, chairman; A. H. Armstrong, R. Beeuwkes, H. W. Cope, J. H. Davis, J. C. Davidson, J. V. B. Deur, C. H. Quereau and L. S. Wells.

Discussion of Report on Heavy Traction

The discussion of the report on heavy traction was opened by H. H. Norris, ELECTRIC RAILWAY JOURNAL. He pointed out that, in giving this year a synopsis of the electrification activities of the committees of the several national societies concerned with heavy traction, the heavy traction committee had taken one step toward the formation of an American committee on electrification. The compilation showed that there is much duplication of effort among the committees, which could be avoided through the functioning of such a joint committee. The value of a central, co-operative and unbiased agency of this kind would be very great. He suggested that the executive committee be requested to consider this matter as soon as convenient.

Mr. Norris said, further, that as an example of the kind of thing that such a co-operative committee could do, nothing would serve better than the elaborate bibliography which the committee had been able to present this year in collaboration with the Association of Railway Electrical Engineers. A joint committee could maintain such a bibliography continuously. He suggested that the association might later provide a condensed and more highly selective list of the most important articles, adding a brief summary of the salient features of each, including articles published up to the date of the completion of the list. The present list might well be reprinted in pamphlet form for sale at a nominal price and the association could advertise it along with other reprints, so that its existence would not be forgotten.

The compilation of the locomotive and multiple-unit car data, in Mr. Norris's opinion, was one of the outstanding features of the committee's report and of the year's work. He expressed the hope that the admixture therein of data regarding heavy multiple-unit car practice on steam roads, interurban lines and rapid transit urban lines would prove to be a prophecy of the time when there will be a greater community of interest between the steam and electric roads in relation to suburban passenger traffic.

Mr. Norris referred to the question that has been raised as to the appropriateness of electrification activity on the part of the American Electric Railway Engineering Association, the contention being that the matter is properly one for the steam railroads to consider and push. It is true that no electrification project is possible unless the railroads are convinced of the savings that can thus be affected. On the other hand, electric traction, having demonstrated its success under steam road conditions, is looking for new fields to develop. It is to be expected, therefore, that initiative will be exerted by the electrical manufacturing and operating interests. The steam railroads will necessarily be somewhat conservative in regard to this matter, partly from financial considerations, partly because they have so much money and talent tied up with their steam equipment. The electrical interests have therefore on their hands a "selling proposition" of enormous magnitude.

The next speaker was S. B. Cooper, Westinghouse Electric & Manufacturing Company, who urged the importance of the suggestion that the work of the committees of the several national associations be co-ordinated in so far as it relates to heavy traction. He also approved the suggestion that the bibliography be reprinted.

W. B. Potter, General Electric Company, also expressed a belief in the importance of inter-society co-operation. He said that there is no doubt of the existence of duplication of effort. Electrification is coming, said Mr. Potter, although it has hardly begun as yet. Conservation of fuel has come to the fore during the past few years. This together with the increasing economy in the generation of electrical power by steam and the development and interconnection of water-power plants, is a factor favoring electrification. Abroad there is much preliminary activity in this direction, and in this country in addition to the projects mentioned by the previous speaker there are several others which are only awaiting the arrival of favorable conditions.

Mr. Potter pointed out that the success of electrification from the operating standpoint is unquestioned. Also the comparative operating expenses with steam and electricity are well determined. If financial conditions improve, if power facilities continue to be developed and if the super-power plan of power distribution is perfected, then progress in railway electrification may confidently be looked for.

J. H. Davis, electrical engineer Baltimore & Ohio Railroad, called attention to the fact that the chart given by the committee did not include the pioneer electrification, that of the Baltimore & Ohio in 1895. He also pointed out the fact that the classification of the 6-9 type Baltimore & Ohio locomotive should be 0—8—0 and not 0—4—4—0 as given in the table.

After the discussion, L. C. Datz, for the committee on subject, explained, as he did in the preceding case, the tentative assignments for next year, following in general the recommendations of the committee.

A "vote of thanks" was then passed, recognizing the efforts of the commit-

tees and of those who had participated in the discussion.

Tuesday Afternoon Session

At the second session of the Engineering Association convention held on Tuesday afternoon the report of the committee on power generation was presented by A. B. Stitzer, Republic Engineers, Inc., chairman of the committee. An abstract of this follows:

Power Generation

The work of the power generation committee for the year took the following form:

1. A recommended form of power contract and the suggestion that this be included in the association's "Miscellaneous Methods and Practices." This was a revision of the report of last year's committee, upon which no action was taken.

2. A supplement to the 1920 report on steam production with particular reference to stoker operation.

3. A comprehensive paper on automatic substations, with tabulation of data, distinction being drawn with regard to "metropolitan," suburban and interurban service.

The revisions made in the previously suggested form of power contract were such as to embody the results of constructive criticism of that form, in the hope that one could be prepared which would be acceptable. To facilitate examination of the proposed contract form it was presented in the report with comments in parallel columns, so that the reasons for each item as worded would be understood.

The report on this subject began with definitions of the four essentials of a contract as follows:

1. "Agreement"—All parties to the contract must agree on the same thing. There must be no misunderstanding about the point at issue.

2. "Two or more competent parties" —The parties must be competent in the eyes of the law to enter into the contract.

3. "Valuable Consideration" — The arrangement must be such that each party will receive something having value (however small) in the eyes of the law, in return for what he gives. A promise to give a present freely, with nothing in return, cannot be enforced at law.

4. "To do or not to do something that is lawful"—An agreement requiring the commission of an illegal act is not an enforceable contract.

Following the form of contract and comments was a memorandum discussing the changes which had been made in the form submitted last year.

As to costs of steam production, the committee reported the impracticability of securing data to check and supplement last year's report on this subject. The principal new material this year consisted in a preliminary statement of the results of stoker experiments made by the Minneapolis Street Railway. The equipment for this purpose consisted of a six-retort stoker, 10 ft. 8 in. in width and 10 ft. in horizontally projected length, placed with flush fronts under a 556-hp. B. & W. boiler set 11 ft. above the floor, with a 900-sq.ft. superheater but no economizer.

The main features of the stoker and furnace setting were: (1) Facility for controlling distribution of coal over fuel bed. (2) Agitation of lower fuel bed. (3) All grate surface effective for combustion. (4) Elimination of arch and bridge-wall reflecting surface. (5) Side wall protected by extension side wall tuyeres. (6) Adequate combustion chamber. (7) Control of air supply above fuel bed. (8) Control of air through lower tuyeres and dump grates. (9) Power dumping mechanism. (10) Exposure of lower boiler tubes for absorbing radiant heat.

The design produces a fuel bed of practically uniform depth, relatively low temperature at the surface of the fuel bed, thorough mixture of gases insuring complete combustion, high heat absorption by radiation to boiler tubes, low maintenance of furnace walls and stoker parts and lower percentage of combustible in the refuse.

These results were secured with bituminous coal of between 8,800 and 9,700 B.t.u. content, 14 to 20 per cent moisture, 16 to 22 per cent ash and 45 to 48 per cent fixed carbon.

In this section the committee stated the conclusion that for high fuel-burning capacity the underfeed stoker has proved to be the most flexible type of fuel burning equipment now available. Insufficient information was available to make possible any report on burning powdered fuel. Except under special conditions and in certain localities there is little probability of the adoption of fuel oil for steam production, until the supply and comparable price become stabilized.

The section of the report dealing with the automatic substations covered twenty-seven pages. A few of the high spots in it were as follows:

The automatic control of the substations in large cities for actual high-capacity, heavy-duty work is now an accomplished fact. The two unit substations of the Cleveland Railway have been operating with complete success. From the operating records available, automatic operation appears to be more reliable than manual operation. Apparently the ideal scheme of installation is to use the smallest possible single-unit stations located at relatively short distances from each other in a very simple and small building. Larger stations are necessary where service requirements are exacting and where the traffic density reaches a point where a service interruption results in large monetary loss.

The area or zone to be supplied by a station, which also fixes the capacity, should be determined primarily by the feeder investment and annual charges, together with losses occurring in the feeder layout. In large cities such other considerations enter as land values, building costs and restrictions, maintenance and operation costs, alternating current feeders and reliability of service. Where the multiple-unit station proves the most efficient and economical to install, the relatively simple and yet comprehensive scheme of automatic sequence operation will give the greatest possible service insurance, as well as good power economy.

In order to prevent reflecting unusual loads back on the rotary the feeder control must have these characteristics: The feeder must be opened promptly on short circuit and the feed to the disturbed sections must be resumed immediately at reduced potential. The best way to reduce the potential appears to be by means of tie feeders connecting to other stations, with an auxiliary bus.

Experimental work is now being done to overcome the difficulties which still exist in applying automatic control in large city systems. In some cases a plan of remote control superimposed on the "automatic" would be satisfactory. A plan for this purpose is this: The dispatcher's office would be located at a central point, preferably the general offices, from which telephone conductors would be extended to each of the automatic substations. At the dispatcher's office each of the automatic substations would be represented by a small panel upon which would be mounted small manually operated contact devices, such as telephone jacks, together with visual and audible signals. Certain master relays, or controlling devices making up the automatic substation control, could be so equipped that by the manipulation of the jacks on the dispatcher's board these relays or devices could be opened, closed or held out or in, as the occasion might demand. The signal lamps would indicate the positions of the relays so controlled. The functioning of these devices by reason of the automatic control would also set up corresponding signals at the dispatcher's board. To enable the dispatcher to know the load conditions of the substations, arrangement would be made to indicate in the dispatcher's office the loading of each station upon a chart. The control wires might also be used for telephone communication.

This section of the report contained also much information regarding the details of the Cleveland substations, and the results of calculations as to relative costs of manually and automatically controlled substations.

Regarding the Cleveland Railway the statement was made that even if there were no financial saving from the use of automatic control the resulting reliability of service would warrant its installation. The company plans eventually to convert the whole system to this type of control.

This report was signed by A. B. Stitzer, chairman; L. D. Bale, H. P. Bell, Walter E. Bryan, N. A. Carle, F. C. Chambers, H. E. Davis, C. A. Greenidge, H. A. Kidder, Charles F. Lloyd, George W. Saathoff, E. H. Scofield, L. R. Shattuck, Walter C. Shade, and E. P. Waller.

Mr. Stitzer first outlined the plan of the report and called upon W. E. Bryan, United Railways of St. Louis, to give the details of the suggested power-contract form. Mr. Bryan did so, giving special attention to the changes which had been made from the form suggested last year. On motion of C. S. Kimball, representing the committee on standards, it was voted to include the suggested form in the Manual under the head of "Miscellaneous Methods and Practices."

Mr. Stitzer then called on E. H. Scofield, Minneapolis Street Railway, to explain the section of the report devoted to power generation. The latter elaborated the printed matter, reading a written memorandum. He said that the work done at Minneapolis was undertaken when it was found that the possibilities with the chain grate and natural draft were inadequate to meet the requirements, both in capacity and operating efficiency, incident to the extreme demands on a steam plant when acting as an auxiliary to an inflexible power supply, such as a water power furnishing power for an urban railway load.

In working out the design of the stoker the most desirable feature of the chain grate, *i.e.* the steady travel of a fuel bed of uniform depth with the least possible agitation, was adopted. In all other respects the design departs materially from chain-grate practice.

The fuel as introduced by the rams is spread laterally by deflector plates so as to cover the surface between retorts. The action of these plates also loosens up the fuel, which, when containing large percentages of moisture and dirt, becomes densely packed while coming through the rams.

Retorts with their secondary rams, under independent control and extending in their action practically to the dump grates, insure a continuous movement of the fuel bed, filling blowholes which may start and maintaining a uniform fuel bed.

The front dump grate, by its lifting action, may be used to break up clinkers as they pass to the rear dump and hold back the fuel bed when the rear dump is dropped. Both front and rear dump grates are power operated and supplied with air, under control, for combustion. The entire grate surface thus becomes active when required; the carbon is burned down to a low percentage of the refuse before dumping; dumping may be done frequently on heavy loads without interfering with output or efficiency, and refuse is disposed of before it builds up into large clinkers.

Side-wall tuyeres, extending approximately to the top of the fuel bed, so designed that there is no dead pocket for lodgment of partially burned coal or clinkers, protect the brick of the side walls from the direct heat of the fuel bed. Both side-wall tuyeres and front-wall air boxes admit a limited amount of air underneath, and near the surface of the fuel bed, tempering the gases and forming a cool blanket over the lower furnace walls.

The rear furnace wall is so built as to expose 90 per cent of the tube length, resulting in a boiler surface double the area of the grate surface exposed to direct radiation from the furnace heat, and a combustion chamber of 13 cu. ft. per square foot of grate surface. The bridge wall rises from the dump grate to a level with the surface of the rear of the fuel bed, then recedes to the rear furnace wall.

A battery of high-velocity steam jets, placed in the front wall about 18 in. above the fuel-bed surface and directed parallel to this surface, thoroughly mix the gases, insuring complete combustion before they enter the tubes, and diverts the gas flow toward the back wall of the furnace, providing for a sweep of the gases over the full length of exposure of the boiler tubes.

Special baffling is designed to give a cross section of passage approximately proportional to the temperature of the gases.

Experience with this equipment has demonstrated the possibility of operating throughout a range from 100 per cent to 350 per cent of rating. Low-grade fuel is burned up to a rate of one ton per retort per hour, and the refuse is disposed of with no excessive loss of carbon or loss of capacity or efficiency while dumping. The air supply is controlled to the most efficient proportion; the furnace temperatures are low enough to prevent excessive clinker formation; little if any slag is formed on furnace walls, and highest efficiency is secured at or near normal rating.

This furnishes a unit of great flexibility, peculiarly adapted to standby and intermittent demands and reducing the losses from banking to the lowest possible in stoker practice.

Following Mr. Scofield, H. D. Savage, Combustion Engineering Corporation, read a paper regarding the burning of powdered fuel. An abstract of his paper follows:

The Burning of Pulverized Coal

The obvious economic advantages of burning coal in pulverized form, particularly as applied to the varying load conditions of street railway operation, would seem to warrant more consideration than the brevity of the committee's report would indicate has been given.

The operation of the Oneida Street plant of the Milwaukee Electric Railway & Light Company during four years has warranted the building of the Lakeside station in such a manner that it would be impossible to use any other fuel than coal in pulverized form. It is safe to assume that the financial interests did not authorize the second station without careful scrutiny of cost versus results.

The cost may be considered under two heads; capital expenditure and operating cost.

The important results in street railway operation are: (1) The ultimate obtainable continuous capacity and ability to meet peak-load conditions. (2) The ability to maintain efficiencies during high ratings and peak periods. (3) The substantial reduction of stand-by losses.

As to capital expenditure, the initial cost will not be greater than for a stoker plant built under similar conditions. Comparative figures of a general nature would be misleading, as every individual plant is a separate engineering problem and involves features that do not apply to another plant. Figures purporting to show the cost of pulverized-coal plants on a unit basis, or a standard cost of coal preparation, are of absolutely no value.

Theoretically and in actual practice the cost of firing pulverized fuel plants, including the complete cost of preparation, is no greater than that of burning coal on stokers. The power required for pulverization is no greater than that required for operating the forced-draft fans and moving the stokers when multiple-retort stokers or underfeed stokers are used.

To realize adequately on the expenditure necessary for boiler plants it is necessary to drive them at the highest possible ratings. Powdered coal would seem to present an ideal opportunity for much higher continuous ratings than have been possible in the past. While stoker-fired boilers can be run for several hours at extremely high ratings, it is possible to run equally high ratings with powdered coal and to maintain them continuously. The usual interference from clinkering and slag does not apply to powdered-coal applications.

It is possible while operating at high ratings to maintain an efficiency far in excess of the normal operating efficiency with stoker-fired boilers. In stoker firing it is necessary, of course, to keep boilers under a considerable fire between the period of the morning peak and the afternoon peak. With powdered-coal firing, when the load begins to drop off, certain boilers are entirely shut off stopping the coal feed immediately. These boilers will carry pressure for several hours.

Recently one of the 1,308-hp. boilers at Lakeside was operated at 160 per cent of rating for five hours. The fuel feed was then stopped and the damper was closed. The boiler "popped" sixteen times during the next three hours. During the following twelve hours the boiler pressure dropped at the rate of about 15 lb. per hour, after which the pressure had dropped to 110 lb. That is, after banking the boiler pressure stayed at between 270 and 275 lb. for three hours and in the next twelve hours dropped 160 lb. The boiler could be

brought up to rating in about five minutes after the fuel feed was started after an ordinary bank of eight hours, during which period the pressure generally dropped to about 200 lb. Thus a very large item of saving occurred during the banked period.

In summing up the advantages to be derived from powdered coal burning, the following may be stated: (1) The capital investment will be no greater than for any usual type of plant. (2) The cost of firing, from coal car to ash car, will be slightly less than with stokers. (3) The maintenance of the furnace and boiler will be less than with stokers. (4) High ratings and high efficiencies will be obtained no matter what the character of the fuel received. (5) The problem of plant operation will be much less complicated. (6) The load can be followed more closely. (7) There will be a very considerable saving in fuel under any condition.

Automatic Substation Discussed

On the committee's topic of the automatic substation prepared discussions were presented by W. E. Bryan, United Railways of St. Louis; C. F. Lloyd, Westinghouse Electric & Manufacturing Company, and G. H. Roosevelt, General Electric Company.

Mr. Bryan said that he was heartily in accord with the view of the committee that in general the single-unit automatic substation is preferable to the multiple-unit station. If full advantage is to be taken of the possibilities of multiple-unit operation the buildings must be small and of simple design, located perhaps on the rear portions of lots of which the fronts are used for other purposes. The cost of land for the multiple-unit station is less per unit than for the single-unit station unless advantage is taken of such possibilities. An ideal system of automatic substations, said Mr. Bryan, is a number of single-unit stations none of which is loaded above its rated capacity for the maximum half hour. Then in case one station is out of service there would be ample capacity in converter equipment in adjacent stations to carry the load. Another item to consider is the fact that single-unit stations are considerably less complicated as to control apparatus than multiple-unit stations.

An important element, said Mr. Bryan, is the method of handling the direct-current feeder circuits. One manufacturing company is advocating, instead of the limiting resistance in each feeder, the use of a device which differentiates between a grounded circuit and a legitimate overload. With this device a grounded circuit would be disconnected from the bus or connected to a tie feeder running to another station, while a legitimate overload would be carried at full voltage unless the overload were sufficient to cause the converter circuit resistances to come into play. The subject of automatic substations is comparatively new and we may expect to see some of our present ideas subjected to modification as the art develops.

Mr. Lloyd said that the list of automatic installations included in the report is a convincing testimonial for this type of apparatus. Automatic control has come to stay. Continuing, he said that the deevlopment had been very rapid and during the past year had been largely in simplifying the equipment, wiring, etc. The usual equipment, he said, protects against starting on low alternating-current voltage, starting on reverse or single-phase, loss of high-tension phase, loss of low-tension phase, loss of machine field current, restarting when undesirable, overheating of machine, direct-current overloads, hot bearings, alternating-current overloads, direct-current reverse-current, over speed, failure to start, failure of field, failure to reverse polarity.

While the manufacturers have been working diligently to simplify the equipment, said Mr. Lloyd, the operating engineers have been active in simplifying the substation building. In Cleveland it was found possible to make a saving of 25 per cent in building cost without impairing the reliability of the substation. Instead of the roomy hand-operated station with all equipment under the roof, we now have a semi-outdoor type that requires only a very small building to house the converter, the automatic switching panels and protective resistance.

Mr. Lloyd said that it early became evident that the standard resistance type of feeder would not meet the requirements of the metropolitan field and now a selective tripping scheme is available for use in connection with direct-current feeders, allowing the carrying of heavy overloads without tripping, but tripping immediately on short circuit. He described the operation of this selective action and went into some detail regarding the several methods for handling direct-current feeders and the advantages of each. The problem of load-limiting resistance in the converter circuit becomes quite involved on large systems, said Mr. Lloyd, and the ventilation problem is one worthy of very careful consideration.

E. P. Waller, General Electric Company, was represented by G. H. Roosevelt of the same company, who said that although the report states that the single-unit station is the best, the multiple-unit installations in Cleveland do not bear this out because of the low cost of buildings and land used in that city. If the cost of the stations used for multiple units is placed on a comparative basis with the estimated costs of stations for single units, Mr. Roosevelt believed that it will be shown that two single units are superior to the multiple-unit installation. In any case, he said, the report is proof of the reliability of the automatic station, regardless of the number of units or the number of feeders concentrated at a station. The factors to be considered are wages, cost of copper and losses. The cost of operation of the manual station is higher than that of either two single units or a multiple-unit automatic installation. Mr. Roosevelt referred to an article in the Sept. 17 issue of the ELECTRIC RAILWAY JOURNAL describing a miniature layout of the entire track and trolley system of Atlanta. The arrangement there provides for two substations at the center of Atlanta, feeding all radiating trolleys.

After the proper location of the station has been determined the important consideration is the type of building. Now that automatic control has proved to be reliable the next step is to reduce installation costs. Automatic control is best adapted for application to converters operated twenty-four hours a day, as the chief economy is the elimination of operators. Mr. Roosevelt referred to one case under consideration where it is proposed to connect a manually operated machine to the bus one hour in the morning and evening to operate in multiple with the automatic units during the peak load. He said that operators can be of great service to the manufacturers by assisting in the determination of the proper feeder control systems. Is it better to use up copper in burning off a "short" or to delay service and call out the trouble gang?

R. H. Rice, board of supervising engineers, Chicago Traction, said that he is very much in favor of automatic substations, as they represent a means of obtaining additional stations without greatly increased cost. At present they have the disadvantage of extreme complexity and the chief objection is the load-limiting resistance and the resistance on the feeders. Mr. Rice introduced Victor E. Thelin, Chicago Surface Lines, who described briefly a substation which he has installed which uses no resistance on either feeders or converter circuit. Mr. Thelin said that he believes the one-unit station to be cheaper in the long run. He has been using the automatic reclosing circuit breaker, which is so designed that the breaker opens instantaneously. An inverse time-limit relay takes care of continuous overload. The shunt rotary is coming into use in connection with automatic substations. Its natural characteristics assist in distributing the load. The development of the automatic substation, said Mr. Thelin, is just beginning. The surface has only been scratched.

Following Mr. Thelin's remarks the recommendations of the committee on subjects were presented and the report of the committee was accepted.

Following this a paper was read by George B. Muldaur, general agent Underwriters' Laboratories, New York, N. Y., on "The Work of the Underwriters' Laboratories." This paper is abstracted elsewhere. Mr. Muldaur then showed a motion picture film giving the audience a graphic idea of the work of the laboratories.

The joint report on stores accounting by the committee on stores accounting of the Accountants' Association and the committee on purchases and stores of the Engineering Association was read at the accountants' meeting on Tuesday. An abstract of their report follows:

STORES ACCOUNTING

Consideration was given to material accounting having to do with the control over the money tied up in the inventories of materials and supplies and the adoption of methods helpful in so regulating such stocks as to minimize such investments without sacrificing service in operation. A preliminary step was to send out a questionnaire to some fifty representative electric railways located in all sections of the United States covering their methods and practices. Replies were received and studied from some twenty-six railways. The committee collaborated in this matter with the committee on purchases and stores of the Engineering Association. The conclusions follow:

A standard material classification is a very great help in the control and regulation of the stock account. Such a classification should be broad enough so that all electric railways can adopt it as a standard. Of twenty-two companies studied only ten had classifications which could be considered at all adequate and of those not more than two or three have forms for reporting under which intelligent conclusions could be drawn as to whether the stock was well regulated. From the best classifications found in use and from that of steam railroad materials recommended by the Railway Storekeepers' Association, a classification was prepared and recommended for adoption as the standard material classification for electric railways. This classification is appended to the report.

Two standard monthly material report forms are also recommended. One is a summary of totals according to storehouses and the second is a detailed report by storehouses and by material classifications, with a combined report for the system as a whole.

Stock books are recommended in storehouses, either in lieu of the more customary form of stock card or stock ledger sheet or in addition thereto. Very few roads are using such a book. Three which do are the Philadelphia Rapid Transit Company, the Public Service Railway of New Jersey and the Pittsburgh Railways. Some of the main advantages of the stock book are as follows:

1. By compelling an actual inventory and a checking of outstanding orders each month it puts the storekeeper in the best position to keep his stock at the proper level and change it according to current demands.

2. It makes it necessary to keep the stock in a better physical condition than under any other method.

3. It enables the storekeeper to keep a close watch on inactive and obsolete stock, otherwise not regularly obtainable.

4. When the material is listed in books, a large number of items can be handled more readily and more easily than on individual cards.

5. It provides a system that can be depended upon as to quantities of material on hand and due on orders, whereas the accuracy of a postal card or ledger record depends upon too many stock clerks issuing materials and office clerks posting entries.

Recommendations were also made as to working stocks, i.e., material drawn out of the storeroom in excess of the daily need and carried as a sub-stock in the shops, at the headquarters of a line or track foreman or at outlying points. A different practice exists on different roads in accounting for such materials. On some roads the practice is to charge out the material to the account for which it was drawn when taken from the storeroom. It would not therefore be inventoried when the general stores were inventoried. This method is deprecated as not sound accounting, as it tends to waste and deterioration of material because the control over it is not good.

On other roads such materials are not charged out when they are drawn out of stock, but when the materials are drawn from sub-stock and replace material used. At inventory time such sub-stocks are inventoried and also set up in the general stores account. This practice is recommended. However, to keep the stock at a reasonable limit and to control it, the report recommends that the general storekeeper and the official of the department interested agree in detail as to the quantities, locations, etc., for the working stocks, and the requisitions on the storekeeper simply be for such quantities as will maintain such working stocks to the limits as agreed upon in advance. Furthermore, stock books should be carried for such materials. By means of these records the stocks can easily be adjusted to the consumption requirements.

The report is signed by R. A. Weston, chairman; E. L. Austin, E. J. Boos, W. L. Davis and Erwin Fullerton for the Accountants' Association and by W. H. Staub, chairman; John Fleming, W. N. Ford, F. E. Henderson, P. F. McCall and H. H. Pace for the Engineering Association.

The discussion on this joint report appears in connection with the proceedings of the Accountants' Association.

Wednesday Morning Session

The presentation of the report of the committee on power distribution, having been postponed from the scheduled time on Tuesday, was taken up at a special session Wednesday morning.

POWER DISTRIBUTION

The outstanding feature of the report of the committee on power distribution this year was a compilation of information on composition and limits of economical wear of trolley wire. The committee divided the subject into: Composition of trolley wire, limits of economical wear and causes contributing to wear. The result of a questionnaire on these topics was given, together with the gist of articles on the subject by S. L. Foster, chief electrician United Railroads of San Francisco.

The committee also recommended a number of items to be submitted to the American Engineering Standards Committee, as follows: As "American Standard," the specification for galvanizing or sherardizing on iron and steel; as "Recommended American Practice," the specification for 600-volt direct-current overhead trolley construction; as "American Standard Specification," the specification for wood poles; as "American Standard Specification," the specifications for tubular steel poles; as "Recommended American Practice," the specification for round and grooved high-conductivity trolley wires, the specification for overhead line material, the railroad specifications for electric light, power supply and trolley lines crossing steam and electric railways, various specifications referring to insulated wires and cables, and the hard-drawn aluminum wire table.

It is not the thought of the committee that all of the above will be acceptable in the present form, but the plan is to set in motion the machinery necessary to bring about, through the American Engineering Standards Committee, such changes as will ultimately render them acceptable to all interests concerned.

On the subject of catenary overhead construction, the committee gave the results of a questionnaire, but recommended the continuation of the study. Progress was also reported as to the standard stranding of cables, regarding which the American Electric Railway Association has accepted joint sponsorship from the American Engineering Standards Committee. As this was the first occasion of the association becoming a sponsor for an American Engineering Standard, the committee gave, in an appendix to the report, a detailed record of the procedure being followed.

As to lightning arresters, both on cars and on the line, the committee expressed a conviction, resulting from a questionnaire on the subject, that traction properties are not giving this essential detail the consideration it should have. Further, the recommendation was made that all operating officials have a survey made of arrester equipment, with a view to bringing it up to recommend practice. Many properties are having lightning damage, due to improper installation or to lack of sufficient arresters, others are not providing proper protection by choke coils, still others have used arrester wiring of too large resistance, etc. The committee included specifications for installing arresters to insure the best results.

The report included a number of appendixes containing valuable data, questionnaire forms, etc. It was signed by Charles Rufus Harte, chairman;

Azel Ames, C. C. Beck, J. H. Drew, R. W. Eaton, H. H. Febrey, C. A. Harrington, C. J. Hixson, C. H. Jones, F. McVittie, M. B. Rosevear, W. Schaake, A. Schlesinger and F. J. White.

M. B. Rosevear, on behalf of the chairman, Charles Rufus Harte, introduced the several sections of the report. He called upon R. W. Eaton, public service engineer, Providence, R. I., to comment upon the joint crossing specification.

Mr. Eaton agreed with the statement of the committee that the specification is "incomplete, is in need of clarification in many places and of revision in many others and is not up to date." The most important question is how to proceed in future so as to produce a specification that will be likely to secure general acceptance. It seems desirable that further work by a restricted committee should be abandoned and that future efforts should be made through the American Engineering Standards Committee or the United States Bureau of Standards or both. It is too bad that the existing specification is not generally known and used by members. Probably the same situation applies on the steam railroads. Certainly the specification is not being adopted rapidly by state and other regulatory bodies.

Mr. Eaton though that the sponsorship of the specification is too restricted and that there is no prospect of constructive action through further co-operation with the steam railroads only. Further, conferences should be held between the power distribution committee and the Bureau of Standards regarding the details of the appropriate parts of the National Electrical Safety Code, so that in case, as now appears to be the trend, the national code is approved by state commissions, the views of electric railway men may be before the Bureau of Standards in connection with any revision of the code.

Next, speaking for himself as an individual, Mr. Rosevear said that the latest revision of the specification, as adopted at the 1919 convention of the association, was participated in by three bodies only; namely, the American Railway Association, the American Railway Engineering Association and the American Electric Railway Association. At that convention the speaker had voiced his objections to favorable action by the Engineering Association, but the report was nevertheless adopted, and it was explained that the revision was so much better than the original that it was advisable for this association to adopt it. It was also stated that further revision was required, and the specification was immediately referred back to the power distribution committee for such action, which, as the present report shows, has been impossible of accomplishment.

The committee at its June meeting thought that further action should be by all interested parties, not by a selected few, and that such general action, leading to the preparation of specifications that would be universally acceptable, might best be secured through the medium of the American Engineering Standards Committee. It was not the idea of the committee to submit the present specification as a basis for a general one as the committee was convinced that it was unsatisfactory in many respects.

Since the completion of the report, further consideration by some members of the committee has raised the question as to whether the action of the 1919 convention really should not be rescinded and the overhead crossing specification rejected and removed from the manual. Admittedly such action would be very radical and might subject the association to severe criticism for its changing attitude. Nevertheless, such action would seem to be a natural corollary of the committee's report. It would also give the association representatives on any general joint committee, such as are formed under the auspices of the American Engineering Standards Committee, greater freedom of action than if the specification remained in force as a "Recommended Specification."

Next a communication was read from Thomas Sproul, Public Service Electric Company. He said that he could not agree with the recommendation of the committee that the preparation of specifications covering the type of construction to be employed by electric light, power supply and trolley lines crossing steam and electric railways is a proper study for a committee organized under the auspices of the American Engineering Standards Committee. The subject is already completely covered by the National Electrical Safety Code, which includes rules covering all types of overhead and underground constructions, crossings being only a small part. To give separate consideration to a crossing specification will tend to interfere with the adoption of the entire code as a standard by the American Engineering Standards Committee.

General standardization of a crossing specification is particularly desirable, but an acceptable standard can only be prepared by basing such a specification on the National Electrical Safety Code, which, as the result of the care exercised in its preparation, is being adopted in many states as a basis for the preparation of rules regulating such construction. Mr. Sproul therefore urged that the association suggest to the committee on power distribution a revision of the specification in accordance with the National Electrical Safety Code, rather than that the construction of crossings be given separate study by a special committee under the auspices of the American Engineering Standards Committee.

Dr. M. G. Lloyd of the United States Bureau of Standards was next called upon. He spoke of the way in which the state commissions had made use of the National Electrical Safety Code, both in its original form, that of 1916, and the present revised form. It has largely taken the place of sundry codes previously used. It had an almost immediate effect in unifying procedure. No argument is needed as to the need for uniform rules. The men of the Bureau of Standards were disappointed that, in 1919, the association adopted the specification without consulting them. He hoped that the action would be rescinded, but said that there could be no objection to the calling of a conference on the subject by the American Engineering Standards Committee.

Speaking from the standpoints of several interests in this matter, Martin Schrieber, Public Service Railway, Camden, N. J., opposed rescinding of the 1919 action, particularly as the specification is to be revised. Opinion is divided as to the status of the safety code, and, he thought, both the code and the specification should go to the American Engineering Standards Committee. After this the recommendation of the committee was adopted.

Overhead Catenary Construction

The next topic taken up was the construction of catenary "overhead." In this connection W. K. Archbold, Archbold-Brady Company, read a communication from R. L. Allen, chief engineer of the company, stating that a type of supporting structure should be chosen with a view to the lowest annual capital and maintenance cost. The allowance for maintenance of wood poles should be studied in view of the prospect of constantly rising costs for renewals. It is difficult to lay down general rules for selecting spans and types of supports, due to the differences in conditions on different properties. Where line voltage is so high that the cost of insulators per mile is important, it is advisable to use longer catenary spans, especially if a large part of the track is on tangents. Where much feeder capacity is required, the total strains and cost may be reduced by using the feeder as a messenger.

As to the assumption that a steel messenger will have a modulus of elasticity of 29,000,000, this is correct for a single wire, but on account of the spring action in a stranded cable the value should be taken at about 22,000,000 in this case.

It would not seem desirable to put in steady strains as close as 300 ft. on tangents, as each fixture tends to make a hard spot in the wire, and general practice appears to be to place the steady strains from 500 ft. to 1,500 ft. apart. Sometimes they are omitted altogether. Again, if the line structures are substantial, full anchor bridges would not appear to be necessary.

The primary purpose of catenary

construction is to obtain a trolley contact without hard spots. The cause of arcing on a contact line is the impact at points of support. This varies directly with the pressure of the collector and the square of the speed. The weight of the portion of the hanger which is integral with the contact wire tends to increase the hammering effect. The force of this blow varies inversely as the weight of the contact wire per linear unit and inversely as its tension.

Longer Spans May Be Cheaper

In a communication read as coming from M. W. Manz, the Ohio Brass Company, the writer gave an estimate of the saving secured by increasing span length from 150 ft. to 300 ft. He said that from 10 per cent to 15 per cent may thus be saved. With the longer spans as used on the Chicago, Milwaukee & St. Paul Railroad, two No. 0000 contact wires are supported on a ½-in. messenger with about 300 lb. loading per pole bracket. With a 7/16-in. messenger and one No. 0000 wire, the total load would be about 240 lb. per bracket.

Mr. Manz gave as a formula for curve work the statement that, approximately, the length of the mid-ordinate in feet is equal to seven-eighths of the product of the degrees of curvature and the square of half the long chord or half the pole spacing in percentage of 100 ft. He also expressed preference for a contact wire height of 24 ft., if commercial freight haulage is to be considered.

Mr. Manz gave a set of logarithmic diagrams for calculating sags and tensions for a wide range of spans, with provision for variation in temperature.

H. M. Gould, Department of Street Railways, Detroit, Mich., sent in a statement that the Department of Street Railways has installed catenary construction at two steam railroad crossings, the first one having a clear span of 190 ft., and covering thirteen tracks, and the second having three shorter spans and covering eight tracks. In both cases the contact wire is No. 00 round phono-electric, with §-in. stud bronze clinch ears and a §-in. round copper-clad steel hanger, looped over the messenger. In the first instance the messenger wires are § in., seven-strand, copper-clad steel, supported by two cross spans of the same material. In the second case the messenger wires are 7/16-in., seven-strand, copper-clad steel, suported by two cross spans of the same material. The span lengths were automatically fixed. Copper or copper-clad steel was used to ward off the corrosive action of the locomotive gases. A flexible hanger was used to cut down the wear on the trolley wire, which was installed 22 ft. above the rails as required by law. A hanger spacing of 15 ft. was decided upon as this is the maximum which will allow the trolley wheel just to raise the trolley wire and hanger. A §-in. hanger was used because it was only necessary to thread a standard rod and this could be used with a standard §-in. boss clinch ear.

This citation was made to show that the reasons for any particular installation are just as important as the details, and the quickest way to bring about standardization is to eliminate those methods which have no good reason for existing.

Discussion on Qualities of Trolley Wire

Mr. Rosevear opened the discussion on trolley wire by stating that the wire of today is better than earlier wire, but that specifications are needed to prevent the effects of haste in manufacture due to competitive conditions. He deplored the fact that so few companies purchase wire by the association specification. He then called upon the secretary to read a communication from S. L. Foster, Market Street Railway, San Francisco, who said that while what he wished to contribute is not new, this seems to be a good time to bring it up again. Although the trolley wire used on the San Francisco property was bought by the association specifications and carefully inspected, it occasionally "broke off like macaroni when we put it in a splicer," to use a lineman's words. While this may have been an exaggeration, the experience described was unusual and disconcerting. Mr. Foster said that he had heard of a practice followed in Europe of specifying a certain number of up-and-down bends in the wire to be withstood without fracture. He thought that if the wire in question had been subjected to such a test the defects would have been discovered. He said that the use of hard-drawn wire had been largely abandoned in San Francisco. Figure 8 and grooved wire had not been used there for many years.

Mr. Foster expressed preference for No. 00 round wire with 15-in. clinch ears. The clamp ear does not protect the lower surface of the wire where the blow of the passing trolley wheel is delivered. With the clinch ear, inclosing the wire all around, the lower surface of the wire is protected. By the judicious use of clinch ears much longer life can be secured from the whole length of the trolley wire.

Mr. Foster did not claim that the clinch ear will give ideal results. The ear should be carefully designed to give the smoothest possible entrance and exit for the passing trolley wheel and should have more metal around the trolley wire measured both transversely and vertically at the center than elsewhere.

On this subject H. M. Gould wrote that the lack of reliable data is a serious matter and is inexcusable. If the railways would make systematic tests of trolley-wire wear valuable data could be readily obtained. He said that he is working with one of the manufacturers in the development of a spring hanger and a flexible strain plate for the purpose of reducing wear on the trolley wire at the ears and strain points respectively.

The next speaker was Horace A. Staples, American Copper Products Company, who expressed preference for numerous reductions in wire drawing. Specifications should be considered from the standpoints both of the user and the manufacturer. Sometimes it seems as if it was believed that "if it's harder to make it's better." He thought the torsion test all right if that is what the customer wants, but he did not see why the tensile strength should be limited. The A. S. T. M. and A. E. R. A. specifications should be harmonized.

J. L. R. Glover, Bridgeport Brass Company, spoke regarding high-strength wire, in connection with which, as with all other wire, the matter of care in handling should be considered. Breaks are important as well as wear. Nicking is particularly bad. Wire is sensitive to handling both in erection and in the storeroom.

H. G. Burd, National Conduit & Cable Company, backed up Mr. Glover as to breaks. He thought that the reasons for non-use of the standard specification are lack of interest and the possibility of higher price.

E. H. Scofield, speaking for the railway men, said that fatigue should not be overlooked. Recent experiments showed 60 per cent of the breaks in a given case were due to this. More data are needed here. In the "Twin Cities" a flexible hanger and general use of span construction have eliminated hard spots. Then, as to the method of collection, Mr. Scofield said that in cities little has as yet been done with sliding contact. His experiments show that a shoe 3 in. to 4 in. long requires only one-half the pressure of a wheel. Wheel wear is largely due to burning. No flashing occurs with the shoe at high speed, and there is no vibration on the roof of the car. A great source of trouble with wheels is due to the fact that they wear "out of round."

The specification for overhead line material was then taken up. Certain minor revisions were approved and the specification was referred to the standards committee with a view to submission to the American Engineering Standards Committee. Other recommendations of the committee to the same end were approved.

Before the morning session was adjourned a suggestion was received from James H. Drew, Drew Electric Company, to the effect that sentiment out in the industry seems to favor some change in the form of the Engineering Manual to make it more convenient for use. President Gove said that this matter would undoubtedly have early attention. A resolution, suggested Monday by H. H. Norris, ELECTRIC RAILWAY JOURNAL, regarding a move to bring about unity of action in regard to electrification of steam railroads was passed.

After hearing a report from the committee on subjects regarding power-distribution-committee assignments for next year, the meeting adjourned.

Wednesday Afternoon Session

At the Wednesday afternoon session of the Engineering Association R. C. Cram, chairman, presented the report of the committee on way matters, in abstract, and discussion was called for as each subject was presented. Martin Schreiber, chairman of the committee on standards, presented the recommendations of that committee.

WAY MATTERS (INCLUDING WOOD PRESERVATION)

In presenting the report of the committee on way matters the chairman read from an abstract of it which was printed in connection with the advance copies. This is a new feature of convention reports. Attention was called by the chairman to the size of the report and to the number of subjects which he believed to be too many for adequate consideraton by any single committee.

The standardization of frogs requires adoption of standard track center distances, and a set of eight distances was recommended. The work of standardizing branch-off frogs received much study and a proposed scheme with a large number of tables was presented as a progress report. Similarly a set of tables for car clearance easement curves were given and a study of these tables by the members of the association was suggested. A set of engineering data for standard crossovers and turnouts was presented for adoption.

A progress report on curved contours for wheel treads indicated the desire for further study in co-operation with the equipment committee.

The subject of curved treads for plain girder and girder guard rails was exhaustively treated and includes a number of drawings. The committee recommended that the treads of the guard rails and plain girder rails be left as at present. An important recommendation is given, calling for the inclination of tilting of plain girder rails.

The progress report on the investigation of arc-weld joints contains matter of interest to all track engineers who are studying this type of joint. A large number of illustrations are included, covering apparatus and types of joints in use. Seven conclusions are reached, indicating the need for much more study of the process, and the subject is suggested for continuation.

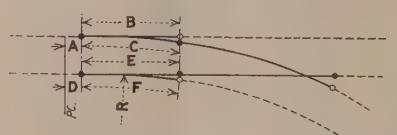
A complete specification for special trackwork of the rail-bound insert type was presented for adoption as a recommended specification.

The study of the proposed impression test for girder rails was continued in co-operation with representatives of the A.S.T.M. The test is proposed by the A.S.T.M. as a substitute for the drop test. Some modifications are suggested for the test as proposed by the A.S.T.M., but no agreement with the latter body was reached. The committee believes the subject needs further study.

A brief progress report on designs of substitute ties was presented, and the subject is suggested for continuation as it is considered to be of considerable importance. Time did not permit the committee to give the subject much attention.

The subject of wood preservation was considered jointly with the committee on buildings and structures and on power distribution. A separate joint report was found desirable, and this was presented separately. The joint report contains a mass of information on the whole subject of wood preservation as related to the electric railway industry. A number of recommended specifications covering different materials and processes was presented. The joint report includes a valuable glossary of terms used in wood preservation which is thought to be the first compendium of such information ever prepared. It should be of great service to all who have to study the general subject of wood preservation.

Several important changes in existing standards and recommendations



DIMENSIONS OF SWITCHES AND MATES

(This table is to be withdrawn in favor of the revised table herewith):

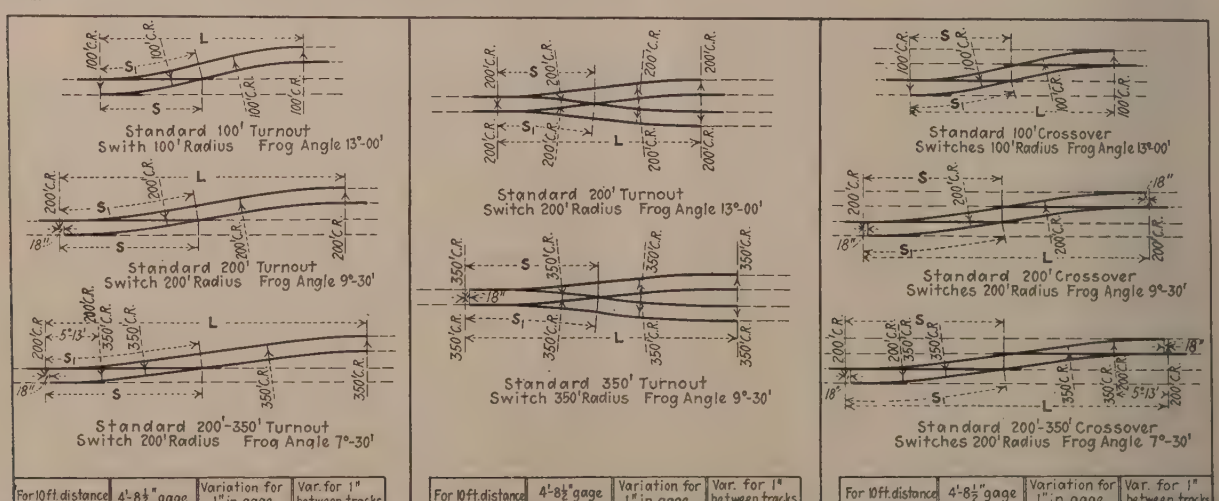
Standard Radius	Radius for All Gages R	Dimensions A	B and C	D	E an F
50-ft. lateral.....	47 ft. 7½ in.	—6 in.	10 ft. 0 in.	—6 in.	10 ft. 0 in.
75-ft. lateral.....	72 ft. 7½ in.	0 in.	12 ft. 0 in.	0 in.	12 ft. 0 in.
100-ft. lateral.....	97 ft. 7½ in.	0 in.	13 ft. 6 in.	0 in.	13 ft. 6 in.
150-ft. lateral.....	147 ft. 7½ in.	12 in.	15 ft. 0 in.	12 in.	15 ft. 0 in.
200-ft. lateral.....	197 ft. 7½ in.	18 in.	16 ft. 6 in.	18 in.	16 ft. 6 in.
100-ft. wye.....	97 ft. 7½ in.	—6 in.	10 ft. 0 in.	—6 in.	10 ft. 0 in.
150-ft. wye.....	147 ft. 7½ in.	0 in.	12 ft. 0 in.	0 in.	12 ft. 0 in.
200-ft. wye.....	197 ft. 7½ in.	0 in.	13 ft. 6 in.	0 in.	13 ft. 6 in.
350-ft. wye.....	347 ft. 7½ in.	12 in.	16 ft. 6 in.	12 in.	16 ft. 6 in.

NOTE.—It is recommended that the 100-ft. radius lateral and 200-ft. radius wye shall be used wherever practicable. It will rarely be found necessary to use others.

(This table submitted for adoption as standard design in lieu of the table opposite.)

Standard Radius	Radius for All Gages R	Dimensions A	B and C mate	D	E and F Tong. SW.
100-ft. lateral.....	**97 ft. 7½ in.**	**0 in.**	**13 ft. 6 in.**	**0 in.**	**13 ft. 6 in.**
200-ft. lateral.....	**197 ft. 7½ in.**	**18 in.**	**16 ft. 6 in.**	**18 in.**	**16 ft. 6 in.**
200-ft. equilateral	**197 ft. 7½ in.**	**0 in.**	**13 ft. 6 in.**	**0 in.**	**13 ft. 6 in.**
350-ft. equilateral	**347 ft. 7½ in.**	**12 in.**	**16 ft. 6 in.**	**12 in.**	**16 ft. 6 in.**
50-ft. lateral.....	47 ft. 7½ in.	—6 in.	10 ft. 0 in.	—6 in.	10 ft. 0 in.
75-ft. lateral.....	72 ft. 7½ in.	0 in.	12 ft. 0 in.	0 in.	12 ft. 0 in.
100-ft. equilateral. .	97 ft. 7½ in.	—6 in.	10 ft. 0 in.	—6 in.	10 ft. 0 in.

NOTE.—Radii and dimensions shown in light face type should only be used where special conditions will not permit the use of standard dimensions shown in heavy face type.


Standard 100' Turnout
Swith 100' Radius Frog Angle 13°-00'
Standard 200' Turnout
Switch 200' Radius Frog Angle 9°-30'
Standard 200'-350' Turnout
Switch 200' Radius Frog Angle 7°-30'
Standard 200' Turnout
Switch 200' Radius Frog Angle 13°-00'
Standard 350' Turnout
Switch 350' Radius Frog Angle 9°-30'
Standard 100' Crossover
Switches 100' Radius Frog Angle 13°-00'
Standard 200' Crossover
Switches 200' Radius Frog Angle 9°-30'
Standard 200'-350' Crossover
Switches 200' Radius Frog Angle 7°-30'

For 10 ft. distance between track centers	4'-8½" gage			Variation for 1" in gage			Var. for 1" between tracks		
	100'	200'	200'-350'	100'	200'	200'-350'	100'	200'	200'-350'
Length overall bet. tangent points "L"	66'-1⅛"	92'-11⅞"	112'-11"	0.570451	0.504905	0.638442	0.369566	0.497380	0.632979
Length of str. lead "S"	32'-0⅝"	44'-11⅝"	49'-11½"	0.570451	0.504905	0.638442	No. variation		
Length of curv. lead "S_1"	32'-5⅜"	45'-3⅜"	56'-2⅞"	0.369566	0.497380	0.632979	No variation		

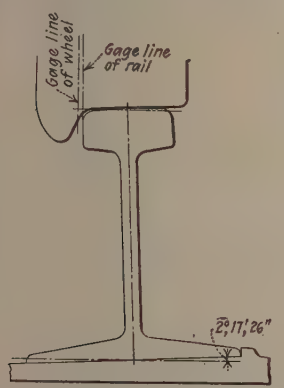
For 10 ft. distance between track centers	4'-8½" gage		Variation for 1" in gage		Var. for 1" between tracks	
	200'	350'	200'	350'	200'	350'
Length overall bet. tangent points "L"	66'-7⅛"	89'-2⅞"	0.368069	0.503171	0.365704	0.501443
Frog setting "S"	32'-1⅜"	42'-11⅜"	0.368069	0.503171	No. variation	
Length of curv. lead "S_1"	32'-3⅛"	43'-0⅝"	0.365704	0.501443	No. variation	

For 10 ft. distance between track centers	4'-8½" gage			Variation for 1" in gage			Var. for 1" between tracks		
	100'	200'	200'-350'	100'	200'	200'-350'	100'	200'	200'-350'
Length overall bet. tangent points "L"	66'-1⅛"	92'-11⅞"	112'-11"	0.570451	0.504905	0.638442	0.369566	0.497380	0.632979
Length of str. lead "S"	32'-0⅝"	44'-11⅝"	49'-11½"	0.570451	0.504905	0.638442	No. variation		
Length of curv. lead "S_1"	32'-5⅜"	45'-3⅜"	56'-2⅞"	0.369566	0.497380	0.632979	No variation		

ENGINEERING DATA FOR STANDARD CROSSOVERS AND TURNOUTS

were proposed, the most important of these being the table of dimensions of switches and mates. This table is to be raised to the status of standard, and two switch radii are to be abandoned. These are the 150 ft. lateral and equilateral. Tables of the former recommendations and proposed standards are reproduced herewith.

A list of subjects which were suggested for study by the Engineering Experimental Station of Illinois Uni-



METHOD OF INCLINING OR TILTING PLAIN GIRDER RAIL, USING INCLINED FACE TIE-PLATE

versity was reported, and ten standards and recommendations were presented for adopton as American Engineering Standards. The report also noted the fact that a special committee has been appointed to study the subject of all types of welded rail joints. The Engineering Association is represented on this committee by E. M. T. Ryder and H. M. Steward. The chairman is Dr. G. K. Burgess of the Bureau of Standards. The work is to be conducted under the auspices of the American Bureau of Welding, of which Prof. C. A. Adams is director.

There were, all told, twenty-three recommendations submitted by the committee, seven of which called for action by the committee on standards.

PAPER ON SUBSTITUTE TIES READ

In connection with the discussion of the way committee's report, a paper on substitute ties was read by T. A. Ferneding, Dayton Mechanical Tie Company. An abstract of this follows:

Nature seems to have provided in the wood and in the soil from which it grows, the essential elements for the construction of good track. The increasing demand and the decreasing supply of wood suitable for cross ties, however, has forced the consideration of some kind of a substitute, but when we look around for that substitute, we are confronted with so many obstacles that we soon become confused. This, however, does not help, but it does suggest that we must confine ourselves to the fundamental principle of "resiliency" that is embodied in the wood tie.

The success of the reinforced concrete buildings gave rise to the thought that to use concrete as the foundation for the track in paved streets would overcome the high costs and failures of gravel and stone. So a concrete beam was laid under the rail as a substitute for a tie. This construction did not prove successful for two reasons: First, the two beams not being tied together gave way at different locations, thus throwing the track out of surface and gage. Then again, the heavy strains and blows that were delivered on the rail were readily and easily transmitted to the concrete, which soon began to deteriorate.

The next step was to increase the size of the concrete beams and construct a reinforced concrete slab on which to rest the rail. Theoretically this idea was fine and apparently had solved the problem of a substitute for wood ties. The idea was gathered from the reinforced concrete building, and made to apply to the track by shifting the steel in various positions. One very important factor, however, was overlooked and that was that the concrete was subjected to an entirely new condition. In the case of the building, the concrete merely had to support a heavy load under a continuous strain, without any abuse; but functioning as a track foundation, it not only has to perform the same duties as in the building but is subjected in addition to the abuse of having to withstand a heavy blow every time a wheel passes over the rail. Concrete, unmolested by any outside influences that will tend to destroy its integrity, will remain in a solid mass indefinitely, but subject to the impact of continuous blows, disintegration invariably follows.

Concrete, because of its strength and density, offers the best assistance to the use of a substitute tie. The steel reinforcement is not only preserved against corrosion but adds strength to the concrete itself and permits of a lesser amount of excavation, which also carries with it a saving of ballast. From a standpoint of economy and durability, reinforced concrete offers the best aid to the use of a substitute tie—with just one reservation—"if it can be properly protected." Through the efforts of the manufacturers in their endeavor to find a substitute tie, attention has been called to two kinds of track construction: monolithic and resilient.

Monolithic means steel in concrete in a solid mass. Resilient means any substance that contains the properties to yield, to give, to absorb, to deflect, etc. The meaning of the word monolithic has been, unfortunately, very frequently misunderstood. It has been said that a track laid on wood ties, with stone ballast and concrete in between the rails and on top of the ties was monolithic, but in reality it is resilient because of the shock-absorbing features of the wood in the gravel or stone ballast.

The mere finding of a substitute for the wood tie in itself is not sufficient, because there are so many other points that are so closely related to it that its use must be given very close consideration; i.e.: (1): the cost of the substitute must be considered, and its relative bearing on the total cost of track when completed. (2): the life of the substitute. By this is meant not only the life of the substitute itself, but the life of the track where the substitute is used. (3): the effect of the substitute. By this is meant the effect the substitute may have on the economy of operating other departments of the railway, as well as the effect on the track itself.

The years of experience that have been had in track construction where the basic principle has been that of "resiliency" and the reluctance with which many engineers are willing even to experiment with any kind of construction where this principle is not strictly adhered to is, I believe, sufficient proof of its correctness.

On the other hand, to deviate from this principle and cast it aside for something diametrically opposite, when the traffic conditions, weight of cars, etc., are growing worse, and assume that monolithic construction in track can go contrary to all the laws of nature and science, in my humble opinion, is not good judgment.

In conclusion, therefore, when selecting a substitute for the wood tie and its attending economies in first cost, select a foundation that is most durable and economical, but in the application of a substitute tie, do not lose sight of the positive destruction that follows when two non-resisting bodies come in communication with each other by an impact or a blow. The weaker of the two will necessarily deteriorate first, and in any construction where concrete is used in any form, no matter how strongly it is reinforced with steel, unless there is some substance interposed between the material receiving the blow and the concrete, the latter will start to disintegrate at the first impact, and its destruction compounded with each succeeding blow.

DISCUSSION ON OTHER FEATURES OF REPORT

In connection with the possible advantages of curved contours for treads of wheels, R. H. Dalgleish, Capital Traction Company, Washington, D. C., reported that he had turned a number of wheels to the contour as recommended by the way committee, and that these had made approximately 22,000 miles in service. There appeared to be slightly more wear on the flanges of wheels turned to this special contour than on standard wheels; otherwise they were apparently giving satisfactory service. Mr. Dalgleish referred to the difficulty of turning wheels to curved contours, but felt that the subject was of sufficient importance to warrant further investigation. He said that the excessive wear indicated by the first 10,000 miles of service was due to the cold rolling of the surface and not to actual wear.

Regarding welded joints, a letter was

read from W. W. Wysor, United Railways & Electric Company, Baltimore, in which he referred to his article in the issue of the ELECTRIC RAILWAY JOURNAL for July 30, 1921. He said that the simplicity, small equipment required, ease of application, cheapness, and freedom from interruption of traffic, all combine to make the arc-weld joint attractive. But there is something more to be done than simply buying an equipment and starting a man to welding. The work calls for careful supervision and skillful operators. Evidence is available to show that internal stresses are set up and chemical or metallurgical changes take place in the metal affected by the arc. In applying the arc-weld or seam-weld joint, by whatever process, we are not eliminating the joint. The rails should be abutted as closely as possible and should be milled or ground on the ends, and the bases slightly undercut so as to bring the heads together. After welding is completed the rail heads should be ground to a true surface and proper contour, using no more grinding than necessary.

Too much stress cannot be laid on the importance of selecting proper operators, men who will take an interest in the work. Such men will soon learn when they are making a proper weld.

E. C. Price, vice-president the Indianapolis Switch & Frog Company, Springfield, Ohio, discussed the report of the way committee at length. He said, in part:

That the subject of joints should lie dormant in the annals of the A. E. R. E. A. from 1910 until 1920 may be attributed to the constant activities on the part of the manufacturers in conducting research and in developing and exploiting special joints and bonds. The wisdom is self-evident of allowing sufficient time between periodical reviews to incorporate the "time and usage test," particularly of a product of this nature. Ten years ago very few street railways, and those confined mainly to the large centers, were using "welded joints," but today the property not employing some type of welded or semi-welded joint is the rare exception. The following statements refer to the "metal-electrode arc-welded joint" known as the "Indianapolis" joint.

The principle of this joint, which is a combined joint and bond, embodies four separate features in its construction and application, namely: (1) It is primarily a web-bearing joint; (2) it is essentially a metal-electrode joint; (3) it is eccentric in shape and contour, and (4) it is staggered.

The web contact feature is in keeping with the principle of the I-beam, of which the rail is a modified form. In splicing I-beam sections, web plates are riveted to both sides of the web, which in effect increases the thickness and reinforces the web. With the Indianapolis joint, the web of the rail is similarly reinforced with steel bars or plates, ¾ in. in thickness, integrally attached by welding and adding 1½ in. to the original thickness. Tests show the strength and resiliency at this joint to be greater than that of the unbroken rail, while tests for conductivity show 138 at the joint compared with 100 for the unbroken rail.

In the Indianapolis joint the best results follow the application of the plates with approximately 500-volt current, cut down through the "resistance welder." The metal electrode is still used not only as being dependable, but for the elimination of excessive or localized heat during the welding process, thereby preventing or reducing to a minimum certain detrimental after effects.

The plates are shaped sloping to afford a great welding area, thereby distributing the lines of force and dissipating the heat effects and also to avoid vertical lines of welding on the web, a matter of vital importance. The points of the plates are undercut, to prevent the joining of welding lines along the base with those coming down the web and to prevent excess welding or "dwelling" on the part of the welding operator at these points, thereby causing segregation. The plates are staggered further to obtain a distribution of lines of force and heat effects, by breaking the opposing lines of welding. The terminating of the joint at each end with but one plate extending and beveled has the effect of tapering off the section of the splicing members. This contibutes to elasticity and resiliency through the joint as a whole. When a severely rigid section, abruptly interposed within a line of flexibility, meets with sudden and concentrated lines of energy or stress, a condition is set up conducive to breakage or abnormal usage.

Experience with the joint has been had in more than 200 cities and towns over a period of nine years, and low maintenance costs have always followed the use of the joint where it has been properly installed under normal conditions.

The potential should be such that the "action" will "impregnate and weld" and avoid the two extremes of "burning" and "melting only" and the welding plates should be of selected mild carbon stock and of great tensile strength, toughness and flexibility.

The welding steel, the "fillet" material, should produce, in conjunction with minor portions of both the welding plates and the rail, a "melt" equal in characteristics to the plates. For example, the tensile strength of a "melt" of fluxated heat-treated electrodes tested from 56,000 to 70,000 lb., whereas a "melt" from the same basic steel without flux or treatment tested but 35,000 lb. per square inch.

The human element factor as it enters into the question of electric metal electrode welding covers a much greater scope than an operator's ability to "draw and hold a true arc." The operator who does not soon become an "artisan" in this respect is an exception, yet with lack of proper supervision or working under unwise directions of his superiors he will not do well. With the work properly done the results are satisfactory.

Paving should be of such nature as to protect and act as a binder to the rails. In new track, the rail ends should be squared or faced that they will abut tightly together, especially at the head. In case of old track, the opening should be closed with an insert, or filled in with welding. Joints should be gound to a smooth surface after welding. Care should be exercised in the selection of temperatures and seasons for installing welded joints, particularly in the case of new work.

Rolling stock should be in relation to track, both as to weight and condition. This not to be taken to mean that all of these constructive factors must be incorporated to admit of the use of arc-welded joints nor that the welded joints will not make up for many of the deficiencies existing in the average track. This they have done in many instances of record, but that is an extra or assumed function. Subnormal conditions include welding on rail that is precrystallized, rail that is eaten through with rust, rail that lacks any substructure or foundation and paving binder.

W. R. Dunham, Jr., then read a statement prepared by H. M. Gould and himself in which they stressed the importance of securing reliable service data in regard to welded joints. Among the attractive features of electric seam welding are that standard or non-standard joint plates can be used, the welding equipment can be easily transported and handled, the cost of welding equipment is not excessive and arc-weld bonds can be installed at the rail joints, at cross bonds or in the special work. At the same time seam-welded joints cannot act as substitutes for ties, ballast and pavement.

The speaker then showed a number of exhibits of joint work in Detroit. He also stated that the paper was intended as a means of clinching the argument that service records and a complete discussion of the policy to be followed will develop the best type of rail joint, whether it be the seam-welded or some other, with resultant benefits to the electric railway industry as a whole.

Chairman Cram then opened up for discussion the topic of girder rail specifications, which he said had been under discussion for two years. He thought that the subject might well be continued. He called on F. M. Speller and G. C. Farkell, both of the Lorain Steel Company, for discussion. The latter read a paper prepared by Mr. Speller and himself, of which the following is an abstract

STEEL MILL EXPERTS DISCUSS DROP AND IMPRESSION TESTS OF STEEL RAILS

The use of the drop test for the purpose of determining the physical properties of rails as they are rolled can be said to be universal in this country. In nearly all specifications this test is

the only physical test which is required.

There has long been doubt on the part of engineers as to the value of the drop test to determine the reliability of the rail, but no test has been devised which so nearly approximates some of the conditions under which steam-road rails are used. When the question of tests to determine the physical properties of rails, put into paving over which electrically propelled cars are operated, is considered, the value of the drop test becomes still more problematical. The lower speed of operation makes the blow from a flat wheel far less serious, while the use of the electric motor eliminates all blows such as are caused by reciprocating parts of the steam locomotive.

To indicate how extreme are the variations in a section of girder rails, the moment of inertia of girder sections now rolled was stated to vary from 31.2 to 182.1, while the metal in the head varies from 34.6 per cent to 66.3 per cent of the total weight.

Failures of drop tests on girder rails made according to the various specifications are extremely rare. There has been shipped to various customers by the rail mill at Lorain, since open-hearth steel was substituted for bessemer in 1909, 1,312,164 tons of girder rails, the product of 23,139 open-hearth heats. During this period there have been 310 failures of drop-test specimens on the original test. Duplicate tests allowed by the specifications withstood the tests in all except twelve cases, so that the total rejections for this period amounted to 710 tons of rail, or less than 0.05 per cent. More than half of these rejections occurred in a rolling of high-carbon and high-silicon steel for a customer who afterward modified his specifications to permit the use of a softer steel.

Objection to the drop test is made by manufacturers particularly when rolling the now prevailing heavy sections, on account of the considerable weight of good material required for the test pieces and the number of short rails which are made when "cutting these tests." In some cases, one-half the allowance of "shorts" is used to obtain the drop tests required.

Recognizing the limitations of the drop test, various engineers have turned their attention to other means for determining the physical properties of rails. Hardness tests have received considerable attention, one form of which, the impression test, has been included in certain specifications to supplement the information obtained from the drop test.

We have so far been unable to arrive at any satisfactory conclusions as to the causes of the occasional failures of individual rails before they get into the track. Chemical, tensile and impression tests made close to the point of breakage have in most cases failed to show any unusual conditions. Every rail rolled for a considerable period was tested by a heavy blow in the web, using a 16-lb. sledge, with negative results. We have been forced to the conclusion that such failures are due to extraordinary abuse when cold straightening the rail which causes failure at that time or introduces locked-up stresses which result in failure later, rather than to inherent brittleness of the steel. The cold straightening operation is a severe test, straining the material beyond the elastic limit at frequent intervals, both vertically and laterally. Should the steel have brittle characteristics, this fact should be developed during this operation.

It will be seen that the impression test furnishes useful information as to the uniformity of the steel with respect to its tensile strength and indirectly gives valuable information probably bearing a close relation to the wearing quality. If data as to the strength of the rails as measured by the impression were collected systematically, way engineers would in time have some valuable records of the steel in their track on which to base future specifications. Under the present American specifications the only records available are the analyses of the steel.

It is true that the impression test gives no information as to the brittleness of the steel, but are such data necessary in the case of girder rails, and if so, does the drop test give this information with sufficient precision to be worth while? Evidently not, by the records of drop test failures given above.

In conclusion the speaker suggested that the impression test proposed by the committee (and adopted by the A. S. T. M.) be included tentatively in the present specification, as an alternative for the drop test. If this is done arrangements will immediately be made for equipment to make this test concurrently with manufacture in the belief that the results will amply justify the expense involved.

Following Mr. Farkell's reading the report of the committee on way matters was accepted, and the report of the buildings and structures committee was next presented in abstract by D. E. Crouse, chairman. There was no discussion. An abstract of the report follows:

Buildings and Structures

The subject of equipment and postpayment of fares was investigated in co-operation with the Transportation and Traffic Association. The committee finds that postpayment schemes are but little used, while prepayment schemes are widely employed and are essentially the same as outlined in last year's report. Turnstiles promote a rapid flow of traffic, the device has but little to go wrong, requires but one attendant and assures a large percentage of fares.

The use of a change booth and coin box has possibilities for a more rapid flow of traffic, but there is the chance of loss of revenue through bad coins; also, in passing, patrons are inclined, in their speed, to throw coins hurriedly at the box, with the result that many coins bounce out, thus detracting the attention of the attendant. The use of a ticket booth and cancellation box is similar to this and has much the same characteristics. On the elevated lines of Chicago the attendant performs both functions by receiving and registering the fares as the patron passes the prepayment point.

The following suggestions are pertinent in the design of either a prepayment or postpayment area:

1. Traffic conditions should be anticipated through conference with plant officials or others in authority who are cognizant of them.

2. There should be an attempt to concentrate loading at as few points as possible, but with sufficient track room to permit loading in a minimum of time.

3. There should be sufficient reservoir capacity in entrance or exits to permit an even flow of traffic.

4. Arrange for operation at a minimum of expense by utilizing plant employees, etc., at rush hours.

5. Allow for storage of cars as the prepayment point is often at a train terminal.

Other means of speeding up loading are front end collection, fare receipts and queues. The advantage of front-end collection is that it permits loading twice as fast. The principal disadvantage is that there is no way of checking the number of passengers in the car against the fares registered. Where fare receipts are sold by traffic inspectors to waiting passengers at congested loading or transfer points the conductor simply collects the receipts instead of making change also. This scheme offers decided advantages to properties using one-man cars and those having a flat fare in excess of 5 cents. It does not in any way interfere with the operation of registering devices nor does it impair data taken therefrom. There is no dual responsibility as between conductors and collectors.

Queue loading can hardly be classed as a prepayment feature except as it facilitates loading. It is a logical outgrowth of the use of safety platforms.

Shop Layouts

Two typical layouts have been designed, one for a property having 150 cars and the other for one having 250. In addition, plans of several representative existing shops are also submitted. It was deemed advisable by both the equipment committee and the buildings and structures committee to include these to give additional information to prospective builders.

The grade of the floor on the shop buildings should be somewhat above that of the surrounding land and streets to prevent entrance of water into the buildings. The minimum clearance between cars and posts, walls and other fixed parts of buildings should be 2 ft., increased on curves. Non-combustible construction materials are recommended. Corners and recesses where

rubbish would tend to accumulate should be avoided. Insurance requirements are important factors in determining many other details of construction, and a study of the underwriter's regulations when planning may save many expensive changes later.

A study was made of the shops and equipment now being used by fifty electric railway properties. The results show that the number of cars operated by the various properties has increased to a much greater extent than the facilities for maintaining them. The committee recommends that a liberal allowance should be made always for growth. In arriving at the area of a proposed shop, it should be borne in mind that the particular type of equipment to be handled and the effect of local conditions should be carefully considered. For instance, a property which contemplates manufacturing cars or car parts should allow additional space for this purpose and an interurban property having but a few heavy cars must provide more space per car.

In the arrangement of departments the following considerations should govern: (1) Cars should progress from motor and track repair shops to carpenter shops and thence to paint shop; (2) have as few isolated departments as possible; (3) have what may be termed the "Centralized Shop Plan"; (4) locate office to permit the master mechanic to keep in touch readily with his various departments; (5) arrange departments to afford economical handling of material and apparatus.

The actual areas of departments in the typical layouts are as shown in the tables which appear at the bottom of this page.

Generally too little space has been allowed between track centers. Both the equipment committee and this committee believe 16 ft. is a desirable spacing and that it should not be less than 15 ft. This does not apply to inspection pits in carhouses, which matter is covered in the 1919 buildings and structures committee report on design of carhouse inspection pits.

For smaller shops undoubtedly ladder tracks are to be preferred. For a moderate sized shop local conditions often dictate which shall be used. For a large shop a combination of the two is often desirable as it gives additional flexibility and speed in handling cars through the shops. For a small number of tracks the first cost of a ladder track will be lower, while for a large number of tracks the transfer table will cost less. In designing a new shop layout it will be well for the engineer to make up detailed estimates covering both and then make a study of the advantages of each to ascertain which will be best adapted to his particular case.

Some companies have had trouble with transfer tables due to the use of old discarded motors to drive them and on account of improper design or construction. If the transfer table is to be used it should be carefully designed and ruggedly built. Transfer tables are of the pit type or flush type. The pit type is less expensive and more desirable. Whether the transfer tables should be in the open or under cover depends on climatic conditions. Where there is much snow and ice it is well to have them under cover.

The subject of pits was thoroughly discussed by both the equipment committee and the buildings and structures committee, and it is recommended that in a repair shop to accommodate modern equipment pit space should be kept to a minimum. Either open or closed pits may be used. The type which appears more desirable at present is the open type with the devil strips covered except at wheel-changing pits. With such construction the workmen can move from one track to the next without difficulty. Pits vary in depth from 4 ft. 6 in. to 5 ft. When conditions require, tile covered with stone or washed gravel may be used to drain subgrade. Sump should be connected to the sewer and the floor sloped to the sump.

The principal types of illumination used in electric railway shops are:

1. General lighting, secured by a system giving uniform intensity throughout a shop without regard to machines or work; it approaches more nearly "daylight" conditions than any other.

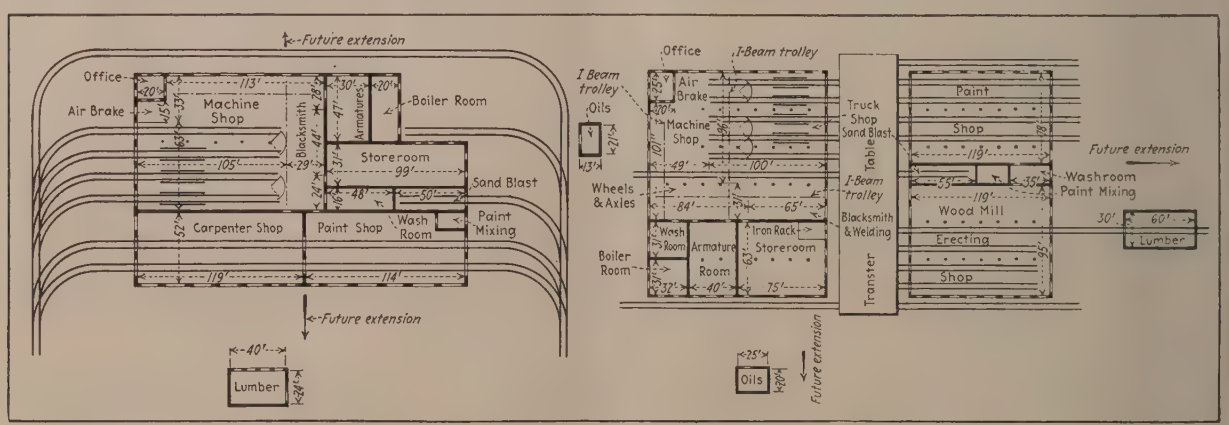
2. Localized lighting, secured by single units suspended over individual working planes.

3. General and localized lighting, a combination of the first two types.

4. Modified lighting, secured by suspending lighting units so that the maximum amount of illumination will be received on the most important working planes.

Individual drive of shop machinery has many advantages over belt drive so far as building construction and natural lighting is concerned. Especially is building construction affected when the machine tools are of a heavy type, which means a rigid support for line shafting. There are other advantages, such as continuity of service and general economy in operation.

The site for the repair shops should have sufficient area to provide for outside storage and to permit of enlarging the buildings to take care of future growth. Many classes of materials, such as wheels, iron castings, lumber, scrap and the like, can be conveniently



TYPICAL SHOP FOR 150 CARS

TYPICAL SHOP FOR 250 CARS

Shop for 150 cars

Departments	Dimensions	Area	Per Cent Area
Overhauling and truck	63 x 105	6,615	21.7
Machine, wheels and axles	(33 x 113) (5 x 29)	3,584	11.7
Blacksmithing and welding	29 x 44	1,276	4.2
Air brakes	15 x 21	315	1.0
Office	17 x 20	340	1.1
Armature	47 x 30	1,410	4.6
Carpenter and mill	119 x 52	6,188	20.3
Paint	(114 x 52)- (14 x 21)	5,634	18.5
Paint mixing	13 x 20	260	0.9
Sand blast	16 x 50	800	2.6
Storeroom	31 x 99	3,069	10.0
Oil house	13 x 21	273	0.9
Washroom	16 x 48	768	2.5
		30,532	100.0

Shop for 250 cars

Overhauling and trucks	96 x 100	9,600	19.2
Machine, wheel and axle	101 x 49 31 x 35	6,034	12.1
Blacksmithing and welding	31 x 65	2,015	4.0
Air brake	26 x 28	728	1.4
Office	20 x 25	500	1.0
Armature	40 x 63	2,520	5.0
Carpenter	119 x 65	7,735	15.5
Wood mill	119 x 30	3,570	7.1
Paint shop	119 x 78	9,282	18.6
Paint mixing	16 x 27	432	0.9
Sand blast	16 x 55	880	1.7
Storeroom	63 x 75	4,725	9.4
Oil house	20 x 25	500	1.0
Washroom	31 x 32 16 x 35	1,552	3.1
		50,073	100.0

stored outside, and this is undoubtedly better than to have them occupying valuable space under the roof. In addition, it is common practice to make use of the shop yard for storing track material, so the plot of ground should be considerably larger than the shop buildings.

The shops should be so located as to reduce non-revenue mileage and obtain a steam road connection. The latter, while not essential, is a great convenience in unloading carload lot materials.

The committee recommends the continuance of the study of the shop design by next year's committee. The committee was D. E. Crouse, chairman; M. V. Haulard, N. E. Drexler, J. R. McKay, S. J. Steiner, B. P. Legare, E. H. Berry, James Link, B. R. Brown, and L. L. Newman.

H. B. Doyle of Philip Kobbé Company, Inc., New York, presented an address dealing with the correct method of purchasing railway supplies. An abstract of this paper is published in another part of this issue.

The joint report on wood preservation as prepared by the committees on buildings and structures, power distribution and way matters, was presented in abstract by Howard H. George, Public Service Railway. Reference to this report is given on page 634 under way matters.

Following the presentation of this report, letters commenting on the report were read by P. R. Hicks of the Service Bureau of the American Wood Preservers' Association and Ernest Bateman and George W. Hunt of the United States Department of Agriculture Forest Service.

These letters set forth the importance of the subject and the need for careful consideration.

Thursday's Session

The first matter taken up by the Engineering Association at its final session Thursday afternoon was the report of the committee on unification of car design. This was presented by H. H. Adams, chairman, and the essential points are given in the following abstract.

Unification of Car Design

The committee was appointed to study the various types of constructions, as given in data collected, to obtain, if possible, a uniformity in dimensions and design, such as post centers, height of window rail or arm rest from the floor, height of car from under portion of sill to top of roof, type of roofs, etc. Once these dimensions and designs are established, it will be thoroughly possible to get a uniform size of glass, probably using standard glass which would not require cutting.

As to the length and width of cars, it is thought that a width corresponding with the dimensions most generally used at the present time could be determined upon, and then, if other widths seem desirable, variations from the width used in the majority of cases could be made by even dimensions, say by increasing or decreasing the same by 4-in. increments. As far as the length of the cars is concerned, this could be varied by the addition or deduction of one or more window lengths.

The above instances are cited as showing the possibilities presented, and it is believed that by studying this subject carefully it will be possible to bring about a uniformity of design that will be of great value to the member companies in purchasing new equipment and to the car builders from the standpoint of having uniform practice to work to.

A summary of the data obtained by the committee was presented showing the maximum and minimum and the weighted average dimensions for the principal items tabulated, as applying to the closed, double-end, double-truck motor cars. The data from which this summary was prepared were studied and a certain amount of the information covering cars that appeared to be outside of the scope desired for consideration was eliminated. The summary submitted represents data obtained from 2,204 closed, double-end, double-truck motor cars. In addition, the committee received information covering 123 double-truck, single-end motor cars, 516 double-truck, center-entrance motor cars, 261 double-truck front-entrance and center-exit motor cars, 62 double-truck, center-entrance and exit and front-exit motor cars, 97 double-truck, double-end trail cars and 438 double-truck, center-entrance and exit trail cars, representing a total of 3,701 cars. The summary of the data for the 2,204 double-truck, double-end motor cars is submitted as illustrative of the variations that are encountered in present-day car construction. The cars from which the data given in this tabulation were taken represent recent design and what is considered good present-day practice.

Under the column "number of cars" is shown the number of cars from which the particular data were obtained. The variations in this last-mentioned column are due to the fact that in certain cases the information called for was not furnished. The committee recommends the continuation of the study of the subject unification of car design. The report was submitted by H. H. Adams, chairman; H. A. Benedict, J. W. Hulme, John Lindall, J. A. Brooks, G. L. Kiepenberger, and V. R. Willoughby.

The discussion of this report was opened by G. L. Kippenberger, St. Louis Car Company. J. W. Hulme, International Railway, Buffalo, said he felt that all equipment men realized that there is a large field for the unification of car design, but the subject as to how far operating companies are willing to go in developing a standard car, or in adhering to any standard recommended, is one that he believed would be hard to enforce. However, there should be some good method of bringing the desirability of standard dimensions before the equipment men, and Mr. Hulme felt that such steps could be best taken at the time that new equipment was purchased.

Frank R. Phillips, Pittsburgh Railways, said that he could see no valid reason for spending so much time in standardizing things that require changing so frequently and he felt that even if a standard car was ultimately adopted, most railway men would still adhere to the types which they already had in service. Mr. Phillips gave several illustrations as to troubles that might occur if the dimensions of car bodies were increased or decreased by increments. One example was that of the aisle space, which is very important, and the decrease of this by even so small amount as a fraction of an inch is not desirable.

Mr. Phillips referred to the relative merits of the arch and monitor types of roof construction, and suggested that in any study to be made very extensive experiments would be necessary to arrive at definite conclusions regarding the relative amounts of ventilation to be obtained from the two types. He referred to some extensive experiments made by the Pittsburgh Railways, in

DOUBLE-TRUCK, DOUBLE-END MOTOR CARS

	No. Cars	Maximum	Minimum	General Average
Length over bumpers	1,428	50 ft. 10 in.	37 ft. 5 in.	47 ft. 2 11/16 in.
Length over corner post	2,105	41 ft. 4 in.	25 ft. 0 in.	32 ft. 11 3/8 in.
Length over platform or vest	2,105	8 ft. 3/4 in.	4 ft. 6 in.	6 ft. 1/2 in.
Width over posts	2,204	8 ft. 9 1/2 in.	7 ft. 10 1/2 in.	8 ft. 4 in.
Width over sills	2,204	8 ft. 9 1/2 in.	7 ft. 7 3/8 in.	7 ft. 2 1/4 in.
Width of platform over crown	2,104	7 ft. 11 1/2 in.	6 ft. 4 in.	7 ft. 1 5/16 in.
Post centers	2,154	36 1/2 in.	28 in.	30 1/8 in.
Height of steps (from track) first	2,204	18 3/8 in.	13 in.	14 13/16 in.
Second	2,204	15 1/2 in.	11 in.	12 1/8 in.
Third	202	11 in.	10 in.	10 in.
Height platform to floor	1,428	11 1/2 in.	0 in.	9 1/2 in.
Height floor to belt rail	2,160	31 1/2 in.	23 5/16 in.	26 1/8 in.
Height floor to bottom of letter board	2,160	6 ft. 8 1/2 in.	5 ft. 3 11/16 in.	6 ft. 3 3/8 in.
Height floor over top rail	1,897	7 ft. 3/4 in.	6 ft. 2 1/8 in.	6 ft. 7 in.
Height floor over roof	2,158	8 ft. 9 1/16 in.	7 ft. 7 in.	8 ft. 3 in.
Height bottom sill over roof	1,426	9 ft. 5 1/16 in.	8 ft. 3 1/16 in.	8 ft. 10 5/16 in.
Underside of headlining to top of roof	1,734	7 1/4 in.	2 1/4 in.	4 1/16 in.
Height from top of roof over top of trolley board	1,426	4 1/4 in.	1 1/2 in.	2 1/8 in.
Size sash glass, bottom	2,160	.....	.....	26 1/2 x 22 1/2 in.
Size sash glass, top	2,160	.....	.....	26 1/16 x 11 1/2 in.
Over-all length of transverse seat	1,386	38 in.	34 in.	36 1/16 in.
Width of seat cushion	1,363	18 in.	16 in.	17 13/16 in.
Length of seat cushion	1,145	34 1/2 in.	30 in.	33 1/4 in.
Height seat back	1,255	22 in.	16 in.	18 1/16 in.
Center to center seats	1,260	32 1/2 in.	28 in.	30 1/16 in.
Sheet steel sides-gage	658	No. 7	No. 16	No. 12
Bolster centers	1,327	27 ft. 9 in.	16 ft.	21 ft. 4 5/16 in.

which it was found that with an arch roof a total of thirty-two ventilators were necessary to give the same ventilation as was obtained from the monitor-type roof, and with the installation of such a large number of ventilators the roof construction was in reality a monitor type.

R. H. Dalgleish, Capital Traction Co., Washington, D. C., said that his railway had also made some very extensive experiments as to the relative merits of the arch and monitor type roofs and that it found better ventilation could be obtained with arch roofs.

H. H. Adams, Chicago Surface Lines, said that the committee had not considered the subject of standardization of cars, but had endeavored to make accommodations which would ultimately lead to some uniformity out of the present chaotic conditions. Referring to the discussion of arch and monitor-type roofs, he said that in Chicago a very satisfactory system of ventilation had been obtained in connection with arch-roof cars.

John Lindall, Boston Elevated Railway, said that he considered the subject of the unification of car design to be very important, but that he feared that it could never be covered in such a manner as to produce a standard car. He said that he personally was an advocate of the monitor type of roof construction, as experience in Boston had indicated that roofs of this type, at least have the appearance of better ventilation and that was all that is necessary to satisfy the traveling public.

The report of the committee was approved with the suggestion that it be continued by next year's committee.

The report of the committee on equipment was then presented by Daniel Duries, chairman. An abstract of this report follows.

EQUIPMENT

The committee reported on twelve subjects:

1. Brake Shoes, Brake Shoe Heads, and Brake Shoe Keys—The three standard designs adopted in 1916 were revised. These included a brake head, shoe and key for 3-in. tread contour A1 and 3½-in. tread contour A2 wheels of a diameter 33 in. to 36 in.; a brake head, shoe and key for 2½ in. tread wheels, contours B1, C, D and E1, 28 in. to 34 in. in diameter, and a brake head, shoe and key for 2½-in. tread wheel contours B1, C, D and E1, 21 in. to 26 in. in diameter to accommodate wheel flanges ranging from ⅝ in. to ¾ in. in height and ⅞ in. to 1 in. in thickness. Two additional designs of brake heads, shoes and keys were presented, namely (a) for 2½-in. tread wheels, contours B1, C, D and E1, 28 in. to 34 in. in diameter, and (b) for 3-in. tread wheels contours B2 and E2, 24 to 26 in. in diameter to accommodate wheel flanges ⅝ in. in height and ⅞ in. to 1 in. in thickness. Limit gages for the brake heads and shoe designs included in this report were also presented. These limit gages are practically the same as those adopted in 1916, but have the gage for maximum width of end lug on back of shoe and minimum space between end lug and flange of shoe omitted, as these are not necessary with the recommended designs.

2. On Standard Tread and Flange Contours for Steel Wheels — The committee resubmitted the eight designs suggested in 1920. Various questions raised regarding these designs were investigated by the committee and were found to present no obstacle to their adoption.

3. Standard Contour for Cast Iron Wheels—The Association of Manufacturers of Chilled Iron Wheels submitted to the committee recommended contours, but after discussion with other committees of the Engineering Association the equipment committee recommended no adoption of standards at this time but that the subject be continued next year.

4. Specifications for Solid Wrought Carbon Steel Wheels—A careful study of the present specification indicated that the Class B tolerances were not being used and these were omitted from the specification. Additional changes conform with the specification of the American Society for Testing Materials. It was recommended that it be adopted as standard in place of the present specification.

5. Helical Gears — Responses to a questionnaire indicate that this type of gearing is being more generally used than ever before. It is well liked, though in most cases it has not been in service long enough to afford conclusive results. The committee recommended that this be given attention by the next committee.

6. Car Arrangement and Design — Considerable work was done by the committee on this subject, but no definite conclusions were reached on account of the limited time available. The committee recommended that all information collected be turned over to a special committee recently appointed and that future study and work be done by it.

7. Life of Wearing Parts—The committee investigated the life of seven equipment parts, namely, trolley wheels, steel wheels, brake shoes, gears, pinions, armature bearings and axle bearings. The information obtained is included in the equipment report in sixteen tables.

8. Personal Observations On the Life of Wearing Parts and Shop Practices—The committee felt that such information would obtain greater publicity and reach a wider circle of men who are particularly interested in this subject if published regularly in technical publications rather than as a part of each year's equipment committee's report. The suggestion of obtaining a reel or two of motion pictures appeared inadvisable at this time due to the high cost of providing the film.

9. Current Lightning Arresters — A study was made in conjunction with the power distribution committee. The The design and method of installation of car arresters was covered by the report of the 1915 committee. The present committee brough the history of lightning arresters up to date and made seventeen recommendations regarding car and line equipment, including the following:

Many properties are having lightning damage due to improper installation or to not having sufficient arresters installed; others are not protected by choke coils or use arrester wiring of too large resistance. These points should be given special consideration and every car in lightning territory should be equipped with arrester and choke coil. Double-end cars should be equipped with two.

Arrester wiring should be No. 6 or larger with soldered joints and not placed in metallic conduit. Connections to arrester and from arrester to ground should be as short and straight as possible.

Line arresters should be placed at each feed tap, with not less than five to the mile. They should be grounded to either earth or rail, but not to both, and the negative wire down the pole should be protected by a wood molding.

10. Revision of Standards and Specifications — This year's committee had several meetings with the committee of the American Gear Manufacturers' Association in order to harmonize the specifications for gears and pinions of the two associations. The equipment committee revised the following specifications and recommended that they be adopted as standard:

Recommended specification Et-15a, specification for case-hardened forged steel gears.

Recommended specification Et-15a, specification for quenched and tempered forged carbon steel gears.

Recommended specification Et-16a, specification for case-hardened forged steel pinions.

Recommended specification Et-17a, specification for quenched and tempered forged carbon steel pinions.

The specifications as revised are acceptable to the American Gear Manufacturers' Association and will undoubtedly be adopted by them following favorable action by the American Electric Railway Engineering Association. The committee recommends that thes specifications as revised be adopted as standard specifications.

11. Curved Contours for Treads of Wheels — The committee co-operated with the way committee, and some of the members of the equipment committee turned wheels to a curved tread and placed these in service. Records are being kept that will show the results which can be obtained from curved contours. The equipment committee is of the opinion that it would be quite a difficult matter to turn wheels with curved contours and doubts the advisability of adopting them as standard. However, it agrees that this subject is of sufficient importance to warrant further investigation.

12. Typical Shop Building, and Shop Layout — The committee co-operated with the buildings and structures committee and furnished information and

tables in regard to the amount of space required for the various departments, the proper arrangement of departments consistent with modern routing of work through the shop and the facilities necessary to accommodate modern equipment. As a result of the various studies and the information obtained, a rather extensive report on this subject is included in the report of the committee on buildings and structures.

The equipment committee's report was signed by Daniel Durie, chairman; H. A. Johnson, Vice-chairman; Walter S. Adams, H. A. Benedict, R. H. Dalgleish, James C. C. Holding, Thomas R. Langan, Frank H. Miller, C. N. Pittenger, E. D. Priest, C. F. W. Rys, F. W. Sargent, Charles F. Scott, Karl A. Simmon, C. W. Squier and J. M. Yount.

The disposition of the equipment committee's report was opened by N. B. Trist, Carnegie Steel Company, who referred to the subject of design of tread and flange contours for steel wheels. He said that if the standards were increased in number, by three, to take care of the objection raised by one railway, the standards would make provision for all the large users of steel wheels. He personally felt that this should be satisfactory not only to the railways but to the manufacturers as well, and that beneficial results would be obtained if the railways would only adhere to the standards as adopted.

H. H. Adams said that two very important subjects regarding standardization had been presented by this year's committee. These were brake shoes and tread and flange contours. He felt that the report was a very valuable one and that this year's committee had presented conclusions that would be of far-reaching effect. Referring to the matter of helical gearing, Mr. Adams said that results from the use of this gearing had led to the development of a new shape of tooth, and whether this is applied to either spur or helical gearing a great step in advance has been made. Another part of the work that he considered valuable was the obtaining data on the life of wearing parts. He felt that this work could be profitably continued.

R. H. Dalgleish discussed the recommendations of the committee in regard to tread and flange contours, and said that the present recommendation of the committee was to increase these so as to provide a total of eleven contours instead of eight as shown in the printed report. This subject had not yet received the approval of the standards committee, but if this meeting approved it the obtaining of further approval by the standards committee would be taken up at the next meeting. Mr. Dalgleish outlined the experience that he had had in a trial of curved contours on wheels in service on his lines. He exhibited several graphs which had been made on these wheels after 21,000 miles of service. He felt that present experiments are insufficient to permit definite conclusions but that the subject could profitably be continued by succeeding committees.

K. A. Simmon, Westinghouse Electric & Manufacturing Company, referred to the subject of wearing parts, stating that the suitability of all equipment for any service could best be shown by such data and that these were particularly valuable to the manufacturers of railway equipment. In analyzing the information contained in this report he had found several apparent inconsistencies in the life obtained from the same parts under almost identical service conditions. He felt that this emphasized the fact that the methods of keeping records by the different railways were not uniform. He suggested that a subject could be profitably added to those considered by future committees that would ultimately lead to some recommendations as to standard methods for keeping records.

J. C. C. Holding, Midvale Steel & Ordnance Company, urged the adoption and use of the committee's recommended wheel contours. G. W. Lyndon, Association of Manufacturers of Chilled Car Wheels, pointed out that standards for cast wheels are in use for steam roads, for industrial companies and for foreign shipments, but there is none for electric railway use. He offered to cooperate in any way to create standards for the A. E. R. A. and urged a study for this purpose.

L. H. Frye, Standard Steel Works, who spoke for the American Society for Testing Materials, complimented the committee on the specifications for wrought steel wheels and said that the A. S. T. M. specifications would probably be revised at the next meeting to conform to the A. E. R. A. specification, as the changes made in the latter were substantial improvements. H. A. Miller, chilled wheel manufacturer, said he anticipated a tendency to work toward the M. C. B. standard tread and flange in the electric railway field. He commented that it is possible to manufacture concave tread wheels, but he could see no reason for such a design. The M. C. B. design has been revised in the opposite direction. He likened making a wheel tread concave because it wears that way to making shoes with run-down heels.

H. Fort Flowers, Differential Car Company, thought that wheels for curved-head rail should have more metal in the fillet between tread and flange to prevent the early wearing of thick and thin flanges. He appreciated that the final determination of the most economical contour would require a very long study and the trial of many different contours.

H. A. Johnson, Chicago, stated that he believed the association is now in a position to adopt as standard the recommended brake-shoe head, key, etc., and the eleven wheel contours. In connection with the latter, he explained that the standards committee had not acted on the wheel contours on account of certain objections which had since been removed. The convention could therefore adopt these contours subject to subsequent approval by the standards committee, which approval had been assured if the convention so voted.

Referring to the wrought-steel wheel specification, he explained that the A. S. T. M. specifications had been clarified in some respects and that the specification for the closer of two tolerances covered there had been eliminated as it was found that this was not used. The more liberal tolerance used does not require so much machining. As to the recommendations on helical gears he thought if adopted, this would be a standard that could also be adopted by the manufacturers.

Discussion on Brake Shoes, Brake Heads, Etc.

F. W. Sargent, American Brake Shoe & Foundry Company, chairman of the sub-committee on brake shoes, heads and keys, said that the committee recommends as standards for this association the following revisions of the 1916 standards of brake shoes, brake heads and keys:

Plate 1.—Brake head, shoe and key for 3-in. tread wheel contour A-1 and for 3½ in. tread wheel contour A-2 for wheel diameters 33 in. to 36 in.

Plate 2.—Brake head, shoe and key for 3-in. tread wheels contour B-2 and E for wheel diameters 28 in. to 34 in.

Plate 3.—Brake head, shoe and key for 2½-in. tread wheels contours B-1, C, D and E for wheel diameters 28 in. to 34 in.

Plate 4.—Brake head, shoe and key for 2½ in. tread wheels contours B-1, C, D and E for wheel diameters 20 in. to 26 in.

Plate 5.—Brake head, shoe and key for 3-in. tread wheels contours B-2 and E-2 for wheel diameters 20 in. to 26 in.

The 1916 standard shows the forked brake head with reduced bearing on each side of the shoe lug, and with narrow toes straddling the end guide of the shoe.

Due to the limited contact of head to shoe, there is excessive wear of the head, and as the toes are worn down, there is an uneven distribution of pressure on the shoe. The shoe becomes loose on the head and wears out of true, resulting in heavy scrap weight. The life of both head and shoe are reduced and maintenance cost increased.

The 1921 design of brake head overcomes this trouble by increasing the area of contact between shoe and head, providing a head with solid ends, with practically a continuous contact with the back of the shoe, supporting the shoe from end to end, and maintaining a uniform pressure, ensuring a true wearing head and shoe.

Considering the motor shoes and heads, the 1916 design gives an area of contact of 7.9 sq.in. between head and shoe, while the 1921 design provides 17.5 sq.in., an increase of 123 per cent for the broad tread wheels. In the case of the narrow tread wheels, the 1916 head shows 5.5 sq.in., as compared with 12.2 sq.in. in the 1921 design, an increase of 153 per cent. A

similar relation exists with the pony shoes and heads.

The 1921 design of head provides a continuous support for the way, which prevents loose heads and keys, and reduces wear of all parts. The key way in both head and shoe have been reduced to give as little side play as possible between head and shoe. In addition the solid square ends of the brake head prevent the shoe from getting twisted on the head and wear unevenly.

To accommodate the solid end brake head, the end guides on the 1921 design of shoe have been omitted. This makes a better shoe and does away with the trouble often experienced with obstruction in the narrow space between end guide and back of flange, which is difficult to clean and gets clogged with dirt, preventing the toes of the forked head going into place.

The taper has been removed from the shoe face in the 1921 design and the tread made flat. If only new shoes were applied to newly turned wheels, the taper would be all right, but the average wheel is a worn wheel. Wheels start with taper, then wear flat and finally concave. The straight or flat faced brake shoe makes a better fit on a greater number of wheels in service than shoes with taper; moreover, the tendency of shoes to pull off the wheel is much less with the straight than with the taper tread. For this reason, the straight face shoes have been preferred and give better service, that is, lower scrap weight.

Formerly brake shoes were made with a single or continuous face curvature. To avoid the use of the improper curvature shoes on a given size of wheel, as well as to reduce the number of patterns and stock to be carried, the composite face curvature has been adopted in the 1921 design of brake shoes. The middle half of the shoe is curved to fit the smaller diameter wheel, while the outer quarters of the shoe face are curved to fit the large diameter wheel. The shoe thus fits the larger wheels on the ends, and the smaller wheel in the middle, and makes a better average fit on wheels of intermediate diameters, and a single pattern only is required to cover the range in wheel diameters noted.

The report was further discussed by Thomas R. Langan and F. R. Phillips.

Election of Officers

Following are the officers of the Engineering Association elected for the ensuing year:

President.—C. S. Kimball, Engineer of Way and Structures, Washington Railway & Electric Co., Washington, D. C.

First Vice-President.—L. C. Datz, Birmingham, Ala.

Second Vice-President.—H. A. Johnson, Chicago, Ill.

Third Vice-President.—A. B. Stitzer, New York City.

Secretary-Treasurer.—James W. Welsh, New York City.

Members of the Executive Committee.—C. H. Cark, Cleveland, Ohio; R. C. Cram, Brooklyn, N. Y.; Charles R. Harte, New Haven, Conn.; Daniel Durie, Connellsville, Pa.

Engineering Association Executive Committee Meets at Atlantic City

A MEETING of the executive committee of the Engineering Association was held on Oct. 2, with the following in attendance: President W. G. Gove, Secretary J. W. Welsh, H. H. Adams, L. C. Datz, H. A. Johnson, C. S. Kimball, M. B. Lambert, F. R. Phillips, E. H. Scofield and A. B. Stitzer.

After the reading of the minutes of the last meeting by Secretary Welsh, he brought up the question of the procedure to be followed in connection with the activities of the American Engineering Standards Committee. After discussion it was decided that the representatives of the association on the American Engineering Standards Committee sub-committees should report on matters of interest to Secretary Welsh. On receipt of information from the representatives, the secretary will report to the executive committee, at the same time sending full information to the standards committee, and informing the membership through *Aera* of what is going on. This will give the standards committee and the members at large an opportunity to transmit to the executive committee any suggestions which may bear upon the subject in hand, in time for the committee to consider such suggestions before taking action upon the recommendations of the representatives. It is understood that the information furnished to the membership will be in abstract form, as it is likely that voluminous material will develop in the conferences held under the auspices of the American Engineering Standards Committee.

It was further decided that continuous reports of progress as to the development of "American Engineering Standards" should be published in *Aera*.

A report was received from Secretary Welsh as to plans for co-operation with the American Association for Municipal Improvement and the line and materials section of the Associated Manufacturers of Electrical Supplies. Such co-operation was approved by the executive committee.

L. C. Datz then reported for the committee on subjects to the effect that several meetings had been held and tentative assignments had been made to all committees. He suggested that these assignments be reported to the association, after the discussion of the several committee reports respectively.

Mr. Gove spoke of the reorganization plans presented to the American Association and raised the question in connection therewith as to the status of engineers in the employ of non-member companies with respect to committee work. After discussion it was agreed that no great hardship will be done the association by the putting into definite form the practice followed for some years, namely, by insisting that committee work be restricted to the employees of member companies.

Some discussion followed as to the effect of non-payment of committee expenses by the association, in so far as it relates to attendance upon committee meetings by committee members. A motion was passed to the effect that this subject be referred to the incoming executive committee, with a view to possible future payment of committee members' expenses as soon as the financial condition of the association warrants such action.

Publicity Men's Meeting

A MEETING of the publicity men at the convention was held in the Chalfonte on Wednesday afternoon. Labert St. Clair, publicity manager of the association, presided. About twenty-five publicity men and executives of companies were present.

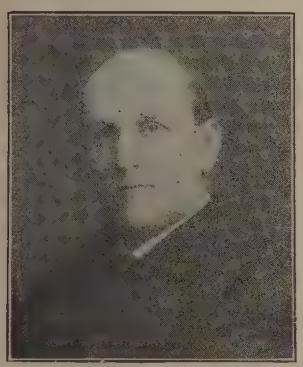
President Gadsden, who was first introduced, said that among the causes of the present trouble with the electric railways that of unwillingness to tell the public took first place. This was an old idea and it had taken about thirty-three years to overcome it. Some persons believe the duty of the publicity man was to write advertisements occasionally. That, however, is not his real work. The speaker's understanding of the fuctions of such a man was that he should be the medium of information between the public and the company at all times. If he was always ready to give facts, the newspapers would rely on him. In this way he could be of value to the company even if he never wrote anything. He hoped these meetings would be continued each year.

W. A. Draper, Cincinnati, said that he always took a great interest in publicity as he was once in the newspaper business himself. The best way was for the president himself to be the publicity man, but as his duties prevent that, it was necessary to have someone to act for him.

Barron G. Collier, chairman of the publicity committee, said that the railway companies now realized the policy of the big stick and seclusion was not desirable. It was only necessary to get the truth before the public so that the railroads would have a square deal. He referred to the successful use for publicity which can be made of spaces in the car not occupied by car cards.

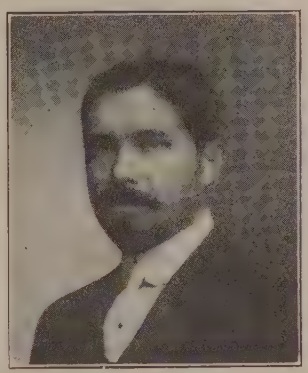
Britton I. Budd, Chicago, spoke strongly in favor of newspaper advertising. Bernard G. Mullaney followed with an interesting discussion on publicity in general and the work of the Illinois Committee on Public Utility Information. Other speakers were J. K. Punderford of the Connecticut Company; H. O. Allison, Beaver Valley Traction Company; A. H. Ferradou, Washington Railway & Electric Company; R. F. Gorman, Harrisburg Railways, and W. O. Clure, Twin City Rapid Transit Company.

Transportation & Traffic Association Proceedings



R. P. STEVENS
Retiring President

Attention of Convention Focused on Reduction of Accidents, Traffic Regulation, Transportation Merchandising and Employee Training —L. H. Palmer, Baltimore, Was Elected President—Desirability of Study of Possible Improvements in Organization Was Suggested



L. H. PALMER
Newly Elected President

THE first session of the Transportation & Traffic Association was called to order shortly after 2:30 p.m. Monday. The first order of business was the annual address of the president, R. P. Stevens. After referring to the work and reports of the different committees of the association and to the work of Mr. Welsh, Mr. Stevens said, in part:

SUGGESTIONS OF PRESIDENT STEVENS

At this time also I would like respectfully to call the attention of the incoming president and executive committee to the following suggestions which occur to me as helpful for the future of our association.

I would recommend that the new executive committee appoint a committee to consider changes in the constitution and by-laws of the association that we may avail ourselves of the experience gained in conducting the affairs of the association in the past.

I feel that only one vice-president is necessary and that provision should be made for a senior member of the executive committee to become ex officio acting president, in event of both president and vice-president being unable to attend to the duties of the office, until the vacancy has been filled in the regular way. This, to my mind, would make an increase in membership of the executive committee advisable.

I would recommend that a plan be considered for the appointment of chairmen of committees, whenever possible, from the membership of the preceding year's committee; that the first vice-president be ex-officio the chairman of the subjects committee for the ensuing year; that the custom be adopted of this committee meeting before and again immediately after the convention and that at the meeting of the executive committee directly after the convention all committees be appointed forthwith so their work may be started before the holidays.

I would recommend a Transportation & Traffic Association committee to consider the transportation phase of trackless trolley and motor bus operation, a subject now occupying an important place in the affairs of our companies, and also a committee to take up the question of the bus competition from a transportation viewpoint.

Revival of the committee on one-man car design and operation and continuance of the committee on freight and express traffic appear to me desirable, and I would further recommend consideration of a suggestion to the *Aera* advisory committee that more space in *Aera* be devoted to the education of transportation employees and that a definite plan to this end be adopted.

In closing, I want to suggest that the business of handling the transportation and traffic problems of an electric railway property is developing rapidly—changing constantly—and that we must keep not only abreast but ahead of the swiftly shifting conditions surrounding public utilities.

In comparing the situation today with that even so late as a year ago one thought that impresses me as most significant is that the theories of radical socialism, which were so menacing to our operations a short time ago, are now wholly discredited and have ceased to be a contagion adversely affecting the minds of either our employees or our patrons. The feeling of "damn the trolley company" surely has subsided, so that our communities are appreciating not only the convenience but the absolute necessity of trolley transportation. This changed attitude has helped our employees to realize the position which they occupy in the industry and to see the limits to which they can aspire in regard to wages and working conditions, whereas in the recent past, in many instances, they failed to realize that there was any limit at all, so far as they were concerned.

Some companies are fast getting their houses in order, so that now they can help make effective for good over the entire country the interest that has been aroused in the utility situation, a self-interest that can be, and should be, established in the minds of the people in such a way that utility operation will be recognized as a business founded upon a national principle rather than on local caprice. Then the utility will cease to be a political football. The one sure, safe and direct way to bring this about is through the employees of the transportation department, the employees who come into constant contact with the public.

The transportation and traffic employees of the electric railways of the country have a latent power hardly realized—certainly never utilized. This force, properly led, can carry any objective when its cause is founded on right. It can overcome the might of politicians, who gained their now declining power through our failure to take the aggressive and to use to the fullest extent the facilities we have at hand.

J. P. Barnes, president Louisville Railway moved that the recommendations in the president's address, so far as they are related to changes in organization, be referred to the incoming executive committee, and those relating to subjects to the committee on subjects.

EXECUTIVE COMMITTEE REPORT

In view of the fact that this report contained merely a review of the minutes of the various executive committee meetings during the year it was not read in full.

The report outlines in full the work laid out by the committee on subjects for the year, practically all of which was accomplished and is given in the reports of the committees following.

The reports of the secretary and treasurer were then read. The secretary's report showed on Sept. 30, 1921,

COMPANY MEMBERSHIP RECORD

	Railway	Manufacturing	Total
No. of members Nov. 1, 1920	355	237	592
Less resignations during year	9	22	31
Add new members during year	7	8	15
Net loss during year	2	14	16
Total members Sept. 27, 1921	353	223	576

114 individual members and 728 company section members. The total ex-

penses for the year were slightly over $1,000.

The president then announced the appointment of the resolution committee and nominating committee. The former consisted of H. V. Bozell, C. L. Van Auken and W. H. Boyce; the latter of W. H. Sawyer, F. R. Coates and E. C. Spring.

The president then called for the report of the committee on merchandising transportation. It was presented by Mr. Coates. An abstract follows:

Selling Transportation Through Education and Advertising

It was agreed that, in view of the thoroughness with which many of the subjects properly coming within this committee's scope were covered last year, the committee should this year pick those several suggestions which seemed most feasible for immediate enlargement and most necessary to put into immediate practice and that it should endeavor to find a definite and specific means for adopting as many of them as possible generally among the various railway organizations in the country.

With this in mind, the recommendations of the committee may be summarized, first, under the head of "education of employees" and then under "advertising."

The first phase dealt with under these headings, the most important of which, in the opinion of the committee, was "Courtesy." The committee has agreed, in substance, that the industry must actively educate its employees to a point where it can demand of them the courtesy and service which is essential to the industry's adequate development. The practical means of accomplishing this end is to sell the idea of service and courtesy to the executives and dispatchers, and to the inspectors immediately over the train crews, as well as to the platform men themselves.

It has been agreed by the committee that it is essential to the success of each individual company that the car rider understand many of the problems with which the company is faced. One important and practical means of conveying such information is to see that the employees who come in contact with the public are themselves acquainted with those problems and the means by which the company is hoping to solve them.

Noon-hour talks in shops and at division headquarters can also be adopted. In each individual property the method adopted will necessarily differ. Noon-hour meetings have proved feasible and highly beneficial in some instances, and it was the opinion of the committee that some companies would do well to make more extensive use of this means of reaching their employees directly.

The official publication of the Association carries in every issue much educational matter of which a large majority of the member companies are not taking full advantage. Some means might well be taken for disseminating these educational articles among a larger number of employees.

A third means of conveying to the employees information which should be helpful to them in understanding many company matters and make them generally better informed on the subject of company affairs, is the posting of pamphlets or bulletins at points of vantage at division points or at the shops. At times when men are standing about waiting for a change of shifts, posters or pamphlets about the bulletin board which are changed frequently, hold out a topic of conversation to the men, and it was the opinion of the committee that this is a very excellent means of imparting to the employees general information in a way that will ultimately react to the benefit of both the men and the company.

The co-operation of employees, to be most valuable, must be directed in definite channels. Company policies must be instilled in the minds of the employees. Employees must be convinced of the sincerity of the company in its desire to give every consideration to the employee's service and well-being. The formation of committees through which recommendations can come from employees and sometimes be worked out, have proved an excellent means to these ends. In many cases labor difficulties have been smoothed out and proposed schedule changes abandoned by the committee itself as not feasible, leaving the men entirely satisfied, whereas had the refusal come from the company there would have been increased dissatisfaction.

The second phase of the committee's recommendations dealt with the matter of advertising, first — directly, by means of newspapers, cards, circulars, time-tables, letters and moving pictures, and, second—indirectly, through employees' memberships in public bodies and civic associations and by company co-operation with national, state and local organizations and affairs.

It was the opinion of the committee that a way must be found to put suggestions and recommendations into effect and that the best means available is to add to the duties of the association publicity manager the work of assisting member companies in putting into operation such of these recommendations as are appropriate for any individual property.

After an elaboration of these points the committee discussed the question of advertising in newspapers, cards, circulars and time-tables. On this point it said that the car crews and other employees have for years read articles in the press which charge the electric railways with all sorts of improper practices, financially and otherwise. In general, they have not and do not now receive corresponding definite and clear-cut statements of facts proving that the contrary is true for the press does not give the same space to the public utilities side of the story that it gives to sensational statements of the demagogue. Again, it must be remembered that bad news and gossip spread faster than straightforward facts.

The real object of advertising is to sell, whether it be to sell an article, an idea or service. It is the opinion of some that "direct advertising" in newspapers can be made to sell more rides in off peak hours. Transportation can be sold just like gas stoves or electric lights or steam heat. Riding on street cars can be transformed in the minds of the public from an ordeal into a real pleasure, a happy pastime, and a form of helpful recreation. It is the opinion of the committee that this can be done by systematic intensive publicity. Advertising directly in newspapers to increase the sale of transportation has been carried on for at least ten years. Sample advertisements considered effective are then reproduced.

The committee declared that the fact should not be lost sight of that every act of each employee is an advertisement. Reputation, honesty, politeness, neatness, promptness, are all advertisements. Quality, price, frequency, everything is an advertisement, either good or bad. Intelligent propaganda would suggest the use of one of the greatest advertising mediums extant, namely, the street cars themselves.

Moving pictures, the committee declared have become the greatest aid to education that civilization has created. They offer today one of the greatest fields for advertising and are peculiarly adaptable to carrying the various types of message which the street railway industry must convey to its users and potential users.

There are two reasons why this is true. First—they reproduce incidents, events and ideas for high-minded people—the 85 per cent; second—moving pictures are projected under facilities ideal for concentration in that there is but one thing before the vision and the room is dark. It is for these reasons that moving pictures offer one of the best ways of putting ideas in the consciousness of human beings. It was the opinion of the committee that there are three ways in which moving pictures can be utilized to advantage by street railway industries. First—safety productions for the car-riding public and the company employees. Second—Publicity productions for the promotion of special financial and engineering problems, which require the approval of the car riders. Third—Industrial engineering productions to instruct shop employees and trainmen in efficiency methods. These three types serve entirely different purposes and are equally important. The safety production will aim to educate the car riding public as well as the car employees. Reports of the National Safety Council show that accidents tend to fall off considerably after every campaign for exercis-

ing greater caution. A series of safety reproduction films should show how accidents on and off a street car occur and how they may be prevented. The purpose should be to instruct the public as a preventative measure or assurance against accidents.

That type of film which may be termed a publicity production requires the utmost good judgment and foresight, and if wisely used, can pave and prepare the way for many otherwise difficult developments, extensions and improvements.

The third type of film production recommended pertains to shop and operating efficiency. The need for training in production is universally recognized. The type of training to be adopted should always concern itself with the development of men to see and understand the causes behind wastes, leaks, power losses, and injuries to equipment which continually occur. With this purpose in mind the methods can be developed from a study of the films to overcome existing inefficiency with regard to human time, machine time, power saving, preservation of equipment.

The most valuable asset a street railway can have on its books is the good will of the public, and to build good will and extend a company's radius beyond its present circle is its responsibility. Advertising is one of the mediums that will carry the character of its organization to its public and help form public opinion. The committee also emphasized the necessity for taking an active part in all civic affairs.

In conclusion the committee suggested that the association's publicity director might add to his duties the work of bringing to the attention of the industry from time to time, in his traveling, such of these recommenations as seem particularly appropriate and aiding them in the inauguration of any new or additional programs which member companies may deem feasible for adoption. It also suggests that *Aera* be asked to run a series of articles on the more important phases of this subject and that these articles be prepared especially for the consumption of the rank and file of motormen and conductors and others directly concerned in operating the cars. Companies having house organs can reprint these articles and gain widespread benefit while others may subscribe for sufficient copies of *Aera* to obtain fairly wide circulation among the trainmen.

The report is signed by J. H. Alexander, chairman, W. H. Boyce, F. L. Butler, H. C. Clark, F. R. Coates, A. H. Ferrandou, B. W. Frauenthal, A. L. Kempster, M. B. Lambert, A. Stuart Pratt, S. L. Vaughan and Elton Wilde.

Discussion by W. L. Goodwin

Purposely assuming a critical attitude toward the sales ideas expressed in the report of the committee on merchandising transportation, W. L. Goodwin, assistant to the president, Society for Electrical Development, New York, began by stating that no one would question the ability of the executives in the electric railway field. The fact that the industry is in bad condition financially, however, indicates that the industry has either been badly directed or this ability misplaced. He considered that the main problem of the industry is one of salesmanship. Before the ideas of the committee can be carried out, he thought it would be necessary to reorganize the companies. The executives are thinking in financial, engineering and legal terms, and not attacking the problems from the sales viewpoint. The electric railway companies are in business to make money and the only way this can be done is to sell transportation. The commodity for sale is transportation regardless of the tool used to produce it. Some one man must be placed in charge of the sale of this commodity, and the sale of it at a profit.

As to the suggestion of the committee that courtesy is essential in selling transportation, Mr. Goodwin remarked that courtesy is a very elementary consideration and that he could not conceive of selling anything without courtesy. He said he had attended a great many important sales conferences and he did not recall ever having heard the matter of courtesy mentioned. Few trainmen realize that their function is to sell. He noted that the committee suggested getting the trainmen together on their own time and said that he would never think of asking men to attend a sales conference on their own time as this would be resented. If it is desired to re-train the men in sales work, this must be done on company time and attendance must be compulsory and not left to the volition of the men as suggested in the report. In hiring new employees, their first training should be in the principles of selling.

All through the report reference is made to advertising and publicity as selling work, but Mr. Goodwin emphasized the point that this is only a subdivision of selling. The spoken and the printed word, properly co-ordinated, are subdivisions of selling, which involves in addition, policy, quality of product, and various other elements. He said he knew of one company which is using extensive publicity in which the printed word does not agree with the company policy. The people feel this and the result is that the publicity represents time and money wasted.

Referring to the committee suggestion that the association publicity manager be made available to assist companies in their advertising and publicity work, Mr. Goodwin suggested that this man should be called the association sales manager and that his work should be to assist the companies in setting up a proper sales organization, after which the matter of publicity would follow as one of the functions of this department.

In the matter of educating the employees to sell, Mr. Goodwin said that this could not be accomplished unless the executives themselves first caught the spirit of selling. He took issue with the committee's statement that the remedy for discourtesy is dismissal, saying that the men were not to blame, that the fault lay with those above and that the men were working under wrong principles. He suggested that the title of conductor and motorman be dropped inasmuch as these are much misused terms and since a new title is sought in connection with the one-man car, substituting the man's own name on his cap and thus establish personal contact. He thought it would be a mistake to urge the sale of company securities to the employees in an effort to win their co-operation by this means, unless the management was absolutely sure of the safety of the investment and that it would earn a return.

Commenting on the list of subjects suggested by the committee for discussion in meetings of the employees, Mr. Goodwin thought that some of the most important had been omitted. The matters of policy, product and competition are the real topics that should be taken up in these sales meetings and of these, competition is by far the most important now. He suggested that a sales demonstration be included among the subjects, wherein an example could be given the trainmen of how to meet the arguments of the dissatisfied customer.

Mr. Goodwin also took issue with the suggestion of the committee that more space in *Aera* be devoted to the subject of training employees in the sales attitude. He said that he thought association journals had done more to retard constructive development in various industries than almost any other thing because they publish only those things that the members like to hear. He maintained that associations should put into their own publication only such matter as would not be accepted by the independent press. He urged greater dependence on the latter and less on the association magazine.

One of the most important tasks in obtaining sales effort from trainmen is to get a good understanding among them, and in fact among the executives, too, of what the problems are, for co-operation cannot be secured until such understanding is had.

In speaking of broad good will publicity campaigns, Mr. Goodwin mentioned the serious error made by another association in signing the campaign by the name of the association, which was unknown and meaningless to the public. He said this would apply also be such a campaign signed by the American Electric Railway Association. As to the noticeable absence of publicity in the industry, he said that this was due to the fact that there are no sales departments of the companies. If these were had this would be the greatest advertised industry in the world. Any advertising entered into must be continued, for the selling job is one that must go on for all time, and the ter-

minable campaign can only be used for putting over some temporary idea. If companies were reorganized to include proper sales organizations, he believed that the condition of the industry would be greatly improved. He also took issue with the idea that the selling of transportation is selling a necessity for he considered it a convenience. A necessity is sold by sufferance while a convenience is sold by putting forth its virtues and meeting all competition.

Discussion Following Mr. Goodwin

Summing up the committee's report in a word, Harry Reid, president Interstate Public Service Company, Indianapolis, Ind., said it would seem that merchandising transportation is entirely a matter of proper public relations. He suggested the formulation of a public relations section of the association, modeled after the public relations section of the National Electric Light Association. He thought that the best method of developing proper public relations consists in giving satisfactory and adequate service rather than in proceeding on the theory that they can be developed by oral and advertised alibis and excuses. Good business management does not depend upon popular sympathy, nor can sympathy help very much in its attainment. There must be something of merit to sell. Through proper salesmanship and advertising success will follow naturally. The time has come when further increase in rates cannot be expected and everyone connected with the electric transportation business should cease referring to it as a "busted" enterprise. Nothing succeeds like success. Shabby clothes and run-down heels rarely bring forth very much sympathy. We have got to get our clothes pressed, our heels straightened and put on a prosperous appearance, even though it is somewhat feigned. Of course, a new suit of clothes and new pair of shoes may be rather difficult to pay for, but it is not so difficult to appear in the market with the optimism of a purchaser. In other words, "optimism" should be written in electric lights on our sign posts, thus pointing to success.

The property for which Mr. Reid is responsible fairly demonstrates, he said, the success of this bit of philosophy. Within the last five years through the purchase of additional equipment, the passenger receipts have increased 42 per cent and the freight earnings have increased from 6 per cent to 27 per cent of the gross business. The additional equipment was financed by the usual car-trust equipment method.

Continuing, Mr. Reid said that if the companies can continue to carry out the policy developed during the war of informing the public regarding the utilities, it will bring about good public relations, without which merchandising transportation is bound to fail. Left alone the cities will not realize or consider the importance of their transportation systems. Yet unfair treatment by city government will tend to destroy these systems and impair the prosperity and comfort of the citizens.

Selling transportation, whether street car or interurban transportation, is perhaps the most important phase of the work. The training of employees in this work is surely very essential to the success of any property. Co-operation and co-ordination of all departments are absolutely necessary. General policies and sales methods should be determined by the executive in charge and extreme care and rare judgment used in determining them. For the education of men to carry out these general policies costs vast sums of money each year.

Mr. Reid directed particular attention to the use of motion pictures, as recommended by the committee. The full importance of this powerful agency is likely to be overlooked unless special attention is paid to it. It was his notion that a very wide distribution and showing of films could be obtained at a comparatively small expense, if there were available pictures of a really instructive character, honestly setting forth the history and present-day problems of electric transportation. They could be shown in the public schools, community centers, Y. M. C. A.'s and even in the commercial theaters at practically no expense.

General publicity is an important factor in paving the way for effective sales work on the part of employees. The transportation systems of the entire country are suffering from a lack of honest, straightforward publicity. Does the public know the efforts that are being made to create and maintain the service they demand? Does the public know the cost of such service? Does the public realize that, because of adverse legislation, both by state and cities, the average investor refuses to buy public utility securities? Does the public know that petty politicians use the transportation facilities of their cities and states as means to stir up hatred and animosity? Tell the public the truth. Do we realize that we have all of these problems to meet? If so, how are we meeting them? Publicity and lots of it is necessary. Let the people know our troubles. Impress the importance of the transportation system and of their co-operation.

Let us look well into our organization. Is it a real organization? Does the head of every department have his duties clearly outlined? Are the departments co-operating properly? Are the employees in each department being properly trained and educated to carry out their part of the program? Are we making future heads of departments in our organizations? Are we endeavoring to fit our whole organization to meet the public squarely and fairly in the discussion of policies and rules which affect the public?

E. M. Walker, general manager Terre Haute Traction & Light Company, declared that merchandising or salesmanship in the last analysis is trading for a profit, and every true salesman or merchant has in mind his profit at the completion of the transaction. This is perhaps the reason why salesmanship is the missing link that has caused the non-success of the various forms of municipally owned or operated projects in public service. It has been well said that a government not only abhors a surplus but also is indifferent to a deficit. Therefore, if a government is not and can not be operated at or for a profit, why worry about salesmanship? One could take a course of lectures on baseball, but no man and no book could teach him how to hit the ball, and hitting the ball is the salesmanship of baseball. The champion home-run hitter is champion because he believes in himself, believes in the team he plays on, and knows that the man he works for will see that his profit is adequate and satisfactory. The all too brief story of the life and death of Jim Burleson, of El Paso, as recently told, did not convey the idea that Jim knew much about the problems of merchandising and salesmanship, yet he was a master. There was another Jim Burleson a quarter of a century ago on one of the suburban lines of Boston. In those days on a Saturday night a rather unruly crowd used to patronize the 11:30 train, which was regularly in charge of Dennis Collins. On nights when the run was in charge of a substitute this train was more than likely to become thoroughly demoralized, but Dennis had a way of selling the railroad to these boisterous rowdies that proved him a thorough believer in himself, in his work, and in his road. What the roads need is more Jim Burlesons. No doubt all railroads have a few, and the task of the sales manager is to pick out as far as possible men of the salesman type. This, of course, can not be done successfully when there are more jobs than men.

Continuing, Mr. Walker said that of perhaps equal importance in the merchandising of transportation is the matter of keeping abreast of the times by meeting the changing and evolutionary standards of speed and comfort in equipment. Companies can not meet 1921 demands with the standards of two decades ago. Many a property has been able by the generous introduction of the light-weight safety car to improve the quality and frequency of the ride, to keep down the fare, to increase the number of riders at least proportionately to the increased service, to stem the tide of the competing jitney bus, and finally, to live and breathe and to preserve the true semblance of real merchandising.

The speaker said that there are fields for salesmanship still unexplored. For example, how to get an increased number of riders interested in buying transportation when the companies need most to sell it—either by a reduced rate between certain hours, or by a free return ride in co-operation with a downtown sale of large proportions. Thus his own company several times this year in connection with Dollar Day Sales has put out through a large department store a limited quantity of

street car tickets at a reduced rate—"a dollar's worth to a customer, while they last." These have been popular items with the store management and customers, and of course have produced something in popularizing the riding habit. The companies can not stop the increasing use of private automobiles but they can extend their efforts to make the automobile owner a short-ride prospect, as he has the riding habit more fully developed than the non-owner.

As to newspaper publicity, "The time to advertise is all the time." The trouble with many companies has been that in days of prosperity they have been too little inclined to think that they had things in common with the public. Then when dark days and trouble came, the public showed its disinclination to bother with the problem. Let us tell the public about the good as well as the bad, telling them the truth always, in which we believe just as implicitly as we believe in ourselves. After all, merchandising of transportation is a matter of men and methods, and there will probably be as many different methods as there are men. But wherever these methods are founded on knowledge of the business, truth, and an unfailing belief in oneself and one's work, that is the basis of true and successful salesmanship.

F. G. Buffe, general manager for the receivers, Kansas City Railways, thought a distinction should be drawn between the sale of a commodity and the sale of a service. If a man buys a razor he does not care particularly about the methods of the manufacture, but if he goes to a barber shop and buys a service, he is greatly interested in the methods of production. Railway transportation is a service, and the customer is concerned in the manner in which the motorman and conductor do their duty. Hence everything which enters into the equipment of a car is concerned with salesmanship. Opinions as to the desirability of employment on a railway have changed, and it is now sought after. The turnover is small, and the men are more anxious to study sales methods. While electric railway service had been declared by some people not to be a necessity, the speaker believed that it was now so recognized in Des Moines and other cities where the service had stopped. Everyone there now wanted the service restored.

Walter Jackson, Mount Vernon, explained that the London Underground Electric Railways Company had a "commercial manager" and described the extensive publicity carried on by the London company. It did not expect to get every dollar back which it spent, but the company knew that if it told every day about its service and why it wanted people to ride, the public would understand that the company was up-to-date. A railway manager should utilize every occasion for developing traffic. On a rainy day merchants would get out special notices about overshoes, raincoats, and umbrellas for sale, but though transportation was equally desirable on a rainy day, the railways did no special advertising. Most companies are unfortunate in that they sell transportation at all times at the same price. Youngstown has recently introduced a weekly pass, and the speaker described ways by which its sale is promoted. It had to be sold to people who wanted to take more than two rides a day, that is, to the voluntary riders, who wished to visit theaters, do shopping, etc., besides traveling to business. This riding was of course of reciprocal advantage to the theaters and merchants. The matter of advertising the pass was therefore taken up with them. As a result several department stores advertised the pass in their own newspaper space, and the theaters used slides with the company's selling slogan about the pass. The Y. M. C. A. evening school was also interested, and got out a poster which helped the sale to pass. Off-peak riding would be encouraged if someone realized that after the workers had left in the morning there were more people at home than were in the factories and stores.

In answer to a question by Mr. Lambert, Mr. Goodwin declared that the sales responsibilities should be put up to one man. It might be all right for people to think that riding was a necessity, but those in the organization should not hold that idea. He then told about the practice of the Electrical Jobbers Association where a member who does not attend the meeting loses his $5 fee, paid from a fund contributed by the members for that purpose. He also thought that where papers were printed in advance it detracted from the interest taken in them.

Britton I. Budd, Chicago, commended the report of the committee. He also said that the idea of a sales manager was a good one as it awakens the selling instinct in a railway organization, but it is impossible to divorce management from general oversight. Courtesy will be practiced by the men only if their supervisors and other officials are courteous. The rules should be such as to bring out what is best in the men. Like everyone else they like to be commended for work well done. Hence, if patrons are urged to report uncivility, they should be asked also to report good actions. In fact, if the request was confined to the commendations, it would be sufficient. It is impossible to overestimate the value of courtesy. If the men feel right toward the management, they will at all times defend it and put forth their best efforts for the company. The speaker was not sure if they would feel the same way towards a sales manager.

The speaker then described the methods followed by the Chicago, North Shore & Milwaukee in developing traffic. Solicitors are sent out far and wide. Illuminated billboards and other ways of soliciting traffic are used. The purpose is not to get the business of competitors, but to create business. In discussing the desirability of mutual understanding between manager and men, Mr. Budd then said that his company was going to have a series of educational talks given to the foremen of his companies on the history of the company. The speaker will be a professor of finance and the facts will thus be carried to the men. It is the hope that by means of these lectures the men can talk intelligently on the subject. In answer to a question he said that his North Shore line had a regular traffic manager.

Mr. Goodwin declared that Mr. Budd had the sales instinct and thus was the sales manager of his company as well as the president.

C. E. Morgan, assistant general manager, Brooklyn City Railroad, in referring to the question of service, emphasized the necessity of a careful supervision of schedules so that the service should be given where needed.

On motion the report was then received by the association, and the meeting adjourned.

Tuesday's Session

The session of the Transportation & Traffic Association on Tuesday afternoon was a joint meeting with the Claims Association and was devoted to traffic regulation and safety work. The first report presented was that of the committee on traffic regulation. This follows in abstract below:

Traffic Regulations

The report contains the code of traffic principles drafted in conference at Washington, Jan. 10-11, 1921, at which practically all associations of national scope interested in traffic were represented. W. H. Maltbie of the committee represented the committee in this work. Another result of the conference was the preparation and consideration, although without final approval, of a modified uniform traffic code.

The code of traffic principles covers not only the methods of administration to be followed but recommends the registration of all vehicles and the licensing of their drivers. Among other things it provides that operators must be at least sixteen years of age to obtain a license and that chauffeurs be eighteen years of age. Speed limits of motor vehicles should depend on the weight and tire equipment of the vehicle, whether pneumatic, solid or metal, and for passenger motor vehicles such speed limit should not be less than 30 m.p.h. in open country, 20 m.p.h. in residential districts and 15 m.p.h. in business districts. Motor trucks and motor buses must carry a metal plate showing the actual weight of the vehicle with its equipment and the loading or seating capacity.

Reciprocity as between states is recommended toward vehicle and operators' licenses for a three-month period in any one year, the time not neces-

sarily being consecutive. Size and weight restrictions by the proper authorities should contemplate the protection, safety and convenience of the traveling public, the preservation of the highways and the meeting of highway requirements. Lighting requirements recommended are those issued by the Illuminating Engineering Society under date of June, 1920. This code of traffic principles is signed as being approved by twenty-one interested associations.

The Washington conference urged the classification of grade crossings as "ordinary" or "dangerous" and declared that in the latter, in addition to being protected by standard grade crossing signs, be marked with uniform and conspicuous signs specifying the speed at which vehicles may cross. The committee requested that the United States Bureau of Standards make a study of such signs, including size, location, etc., and that it should have the advice and co-operation of the signal section of the engineering division of the American Railway Association as well as that of the signalmen of our Engineering Association.

Many favorable comments, the report states, have been made upon the committee's original code of traffic principles and model traffic ordinance. The ordinance, with some slight modifications, has already been adopted by the Canadian Electric Railway Association. The report is signed by H. B. Flowers, chairman; F. R. Cogswell, A. Gaboury, R. F. Kelker. Jr., W. H. Maltbie, H. B. Potter, Fielder Sanders and Paul E. Wilson.

Following this report were papers on traffic regulation by Inspector John O'Brian of the New York City Police Department and J. M. Quigley, Chief of Police Rochester, N. Y. Abstracts of these papers are published elsewhere in this issue.

The report of the committee on safety work was then presented by E. C. Spring. An abstract of this report follows:

Safety Work

A study of public accidents indicates that of the total deaths caused thereby last year 78 per cent, or 60,000, occurred on the highways or in the home. Industrial accidents declined as a result of the concentration of effort put upon them by industrial management. The committee believes that the same amount of vigilance backed by education will accomplish much in the elimination of public accidents.

The teaching of safety must not be made a spasmodic or perfunctory matter and if done it will not accomplish the result sought. Electric railway accidents cover a wider range than other industries largely because their track locations bring them into more intimate contact with both vehicular and pedestrian traffic. Here is a situation that demands close vigilance not only on the part of the operating departments but constant study by all the company officials to improve conditions.

Information collected from 131 companies dealing with accidents and safety work indicates that there is an urgent need for active participation in accident prevention. Of a total of 86,500 accidents reported 50.5 per cent come within classes directly affected by the public safety movement. Fifty per cent of the companies reporting are spending nothing on safety work and the balance only average $2,002 per company per annum. Eighty-six companies do not have departmental safety committees, yet of the thirty-nine who have them, thirty-six report they are successful.

STATISTICAL STUDY OF SAFETY WORK BY ELECTRIC RAILWAYS

Number of Companies Reporting	Yes	No	No Reply
Has company entered into any public safety campaign?	42	80	9
Has company given co-operation to any local safety movement?	49	55	27
Is company member of National Safety Council?	67	54	10
Has company done any work in connection with public schools and to what extent?	50	69	12
Has company carried safety advertising in its cars?	78	49	4
Has company co-operated in safety work with automobile associations?	31	84	16
Has company adopted as a basis the standard code of operating rules of the T. & T. Association?	75	44	12

Electric railway hazards, the report states, may be divided into two main groups, namely, industrial or applying to employees only, and operating or those involving the public. In the first group the hazards are those similar to those of other industries and should be handled along similar lines. The second group divides into three subdivisions, namely, urban, suburban and interurban operation. Each of these three subdivisions is further divided into five more classes, namely, boarding and leaving cars, collisions with cars, collisions with vehicular traffic, accidents to pedestrians and passengers injured on cars. Of these last five classifications, the third and fourth involve most frequently the public safety. Probably in the greater number of cases the driver or pedestrian is at fault for the resulting accident, but that fact does not lessen the need or wisdom of the traction company supporting the public movement. Street railway companies should actively foster the public safety movement in their respective communities, and the place to start is in the home and school, with particular reference to safety on the streets.

The report then goes on to detail how this can be accomplished and illustrations are given of the campaign plans followed in some places. An appendix outlines a suggestion for safety work in cities too small to support a paid local secretary.

The report recommends that the joint safety committee of the T. & T. and Claims Association be made a permanent committee for and under the direction of the American Electric Railway Association, such committee to act in an advisory capacity on matters of safety for that association.

The report is signed by E. C. Spring, chairman; R. E. McDougall, co-chairman, and W. H. Boyce, G. E. Deibert, H. V. Drown, C. G. Rice, C. B. Scott and E. M. Walker.

In discussing this report C. G. Rice, Pittsburgh, stated that there was no reason why transportation and claim men could not work congenially. If the transportation men could cut down the number of accidents, they were entitled to all the credit. The real trouble was that while the transportation men believed in safety, they did not always like to do all that it required. Accidents should be anticipated, and it is just as well to be a little timid at times. He then declared that the report calls attention to the automobile hazard—a live subject. There are 9,000,000 automobiles in the country and they are increasing at the rate of about 2,000,000 per year; in other words, there is one auto for every fourteen of population. In Pennsylvania the 600,000 automobiles, or one for every thirteen of population, killed 1,141 persons in the past three years, with but three convictions. In the first six months of this year they killed 103 people. In Allegheny County alone, where it is figured there are 120,000 machines, the accident ratio has not increased, though it has not decreased. The streets are no longer safe playgrounds for the children, and it is hard for the parents to realize the change. It is not impossible, however, of correction if the idea of safety is sold with the car. The automobile manufacturers and dealers when selling cars should instill into the minds of the purchasers the idea of safety in operation. The standardization of traffic laws will have much to do with the elimination of some accidents. Under present conditions there is not much uniformity, although good work is being done by the Traffic Officers' Association in trying to have a standard code adopted.

Another means of accident control, according to Mr. Rice, is the licensing of operators and having the operators actually demonstrate their ability to handle properly the cars they drive. Strict enforcement of these traffic rules will also do much toward improving public safety. New York City and the State of Massachusetts have done much along this line. In Massachusetts during the past year 1,200 licenses have been suspended and 900 revoked, while in Pennsylvania, where the enforcement is rather lax, there have been only eighty-nine revocations. The formation of local vigilance committees to report violators is not impossible or wrong. The state of mind in most cities requires that something be done to curb the continued reckless operation of motor vehicles.

In the Pittsburgh district what is known as the Safe Drivers' Club is supported by employers, such as coal concerns, taxicab companies, etc., who use a large number of automobiles. A series of meetings is held for the chauffeurs and subjects of interest to safety are discussed. When these employees know that their employers are back of the club they take more of an interest

in its aims. It is planned to close the series of meetings with a public meeting and to urge a central traffic court where all violators of traffic regulations would be treated alike. There is much that can be accomplished in the interest of public safety, but it cannot all be done at once.

Speaking of safety organizations, Mr. Rice pointed out that since the formation of safety committees in the industrial plants of western Pennsylvania the fatalities had decreased from 50 per cent of all accidents to 30 per cent and that a man was now safer at work than at home or on the street. Safety is a development of the mind, a mental attitude, and it does not matter whether it is obtained in the mill, at church or on the street. Safety can be developed only if worked from both ends, so to speak, by teaching it to the child in the school and to the man when at work. The National Safety Council believes in the establishment of local safety councils in every community and experience shows that where established it pays, for it has proved of benefit in many cities.

The traction companies, however, for some reason or other are backward in taking an active part in public accident prevention. Nevertheless, there is every reason to believe that a year's effective organization work along these lines will reflect a decrease in the number of accidents and causes of railway accidents.

Britton I. Budd, Chicago, also discussed the report of the committee. His prepared discussion is given elsewhere in this issue. In addition he spoke of the large number of companies that were doing nothing to develop public safety and stated it was useless to attempt such work in a community unless the traction company helped out in some manner. The money spent for safety work on each of the properties with which he is connected has brought more benefits than any similar expenditure. The effect on the morale of the employees cannot be figured in dollars and cents, for it develops an interest in the company not otherwise gained. It is essential though that the suggestions made by employees be acted upon promptly and, if approved, that the work orders issued should have precedence over other work orders.

It was his belief that it was essential for railways to back up safety organization work and also that it was up to every railway to have a safety organization of its own.

Edward Dana, Boston, complimented the committee on its report and was surprised to learn that the railways were doing so little with regard to accident prevention. It is now time to put the house in order, but it is a problem. It becomes necessary, first of all, to have the co-operation of the whole personnel of the railway employees, which can be done through company training schools. But the contact with the public at large can more easily and perhaps only be reached through the National Safety Council, of which the Boston Elevated Railway is a member. In Boston the number of accidents so far in 1921 has decreased 1,000 over the average for the same period for three years previous. The cost of accidents is less than 2½ per cent of the gross revenue. The company has now its own industrial accident company, with the heads of departments as officers. This has materially reduced the premium which the company must necessarily pay under the Massachusetts laws for similar protection.

H. B. Flowers said that in Baltimore, in co-operation with the National Safety Council, the railway company organized a no-accident campaign week, along lines suggested by the safety council. During that week there were 309 accidents of all kinds, compared to an average of 415 for the four weeks preceeding, a decrease of 106 accidents, or 25 per cent. During the first week following there were 269 accidents, a decrease of 119, or 28 per cent, and for the second week after 295 accidents, or a decrease of 29 per cent. If a comparison is made with the average for the whole nine weeks since the campaign, which is 277, there is found a decrease of 138 accidents, or 33.2 per cent. The effect of the campaign is felt in more ways than one, for the public press and the public at large knew the railway company was behind the campaign.

H. A. Mullett, Milwaukee, told of some of the work undertaken in that city. The Association of Commerce has taken an active part in industrial campaigns for the prevention of accidents. There are two divisions—one composed of manufacturing companies for the prevention of industrial accidents and the other of individuals for the prevention of street accidents. The funds for the industrial accident campaign come from the manufacturers while in the case of street accidents the funds were raised by popular subscriptions to what is called a safe drivers' club. The first year $6,500 was raised—from memberships at $1 each. This year a similar amount was raised, but it was harder, for the idea had to be sold to each subscriber, whereas before it was new and the work was undertaken during a campaign. In addition there is the vigilance committee of 100, on which some motormen are members. They do very effective work, and often from fifteen to twenty-five reports of violations of traffic regulations are turned in. The Milwaukee company has also for the last five years maintained a chief safety inspector and also has local safety committees in the shops and carhouses. The latest innovation is to show photos of wrecked cars and accident statistics graphically comparing each station or carhouse on an equal footing.

A. J. VanBrunt, Public Service Railway, told of the safety patrols or junior policemen which he had formed in the schools. The members of this patrol wear a distinguishing arm band and are trained by a uniformed policeman. They act at crossings in the absence of regular traffic officers and at school recess protect the smaller children.

Wednesday's Session

This was a joint meeting with the Accountants' Association to consider two reports. The first was that of the committee on economics of schedules and was read by Edward Dana, chairman. An abstract follows.

Economics of Schedules

The committee was asked: (1) To develop definitions and analyses of car-hours and crew-hours, (2) to study the question of variable running time, and, (3) to report on recent methods for speeding up traffic in congested centers, as done in Boston, Washington and Kansas City by John A. Beeler, as well as at other points. The committee first recommends the following definitions, the first group referring to car-hours and the second to man-hours:

1. *Running Time* is scheduled time operating between terminals, including time allowed at stops.

2. *Layover Time* is time allowed on schedule for layover of car at terminals.

3. *Run-off Time* is scheduled time to and from carhouses and connecting point of line.

4. *Excess Time* is time of car operating in excess of schedule due to service delays.

1. *Platform Time* is actual time of operating trips, including time between trips allowed on schedule as layover time.

2. *Report Time* is time allowed for preparing car for service or putting car away after service.

3. *Run Allowance Time* is time in addition to platform time allowed to bring run up to prescribed number of hours.

4. *Spread Allowance Time* is time allowed because of length of spread over all time to work a given run.

5. *Guaranteed Minimum Time* is the amount of time allowed to bring the time of extra men up to the prescribed number of hours per day or week.

6. *Overtime* is time worked by men in excess of their regular scheduled run or assignment for day's work.

7. *Continuous Time* is time allowed between completion of regular run and time reporting for extra work. This also covers all swings for which crews are paid.

8. *Instruction Time* is time allowed platform instructors in excess of regular running time, as well as time allowed to students.

Until these definitions have been approved the committee doubts the advisability of formulating any definite method for recording of these data.

On variable running time the committee points out that on the average road there are six different running times, as follows: (1) Inward bound a.m. rush hour, (2) Outward bound a.m. rush hour, (3) Inward and outward bound throughout the base schedule period, (4) Inward bound during p.m. rush hour, (5) Outward bound during p.m. rush hour, (6) Inward and outward bound during the evening and

early morning hours. As speed is an essential factor in determining cost of service, the committee recommends care to prevent waste in running times by using the six running speeds in schedule making.

In discussing the handling of traffic in congested centers the report points out that as street cars are confined to a fixed path and as they carry many times the number of passengers per unit that other vehicles do, it does not seem unreasonable to ask support from the public authorities to reduce delays to a minimum. Agitation along these lines also has the indirect benefit of attracting public attention to the fact that many delays of street cars are due to causes for which the operating company is not responsible.

The following methods are recommended to facilitate loading and unloading in crowded districts:

Loading platforms, which may be placed at heavy loading and unloading points where the street width permits. They should be 4 to 6 ft. wide, from 8 to 10 in. high and from 50 to 100 ft. long. In some situations it has been found necessary to maintain lights on the platforms after dark as a warning to vehicular drivers, but this is not done where there are street lights nearby. The lights should be maintained by the city. They are used successfully in San Francisco, Boston, Pittsburgh, Washington, D. C.; Minneapolis, Kansas City, Baltimore, Newark, Los Angeles and Indianapolis.

Safety zones, marked by upright stanchions, are helpful in reducing accidents and can be used on streets where there is a distance between curb and nearest rail of not less than 15 ft. They are most effective if placed under the control of police department and the city should be responsible for the maintenance of lights on stanchions. White lines on pavement also are useful as a guide to traffic and protection to waiting persons. If the street is wide enough to permit safety zones, the consent of authorities to loading platforms should be asked. Good results reported from Los Angeles, Seattle, Louisville, Milwaukee, Columbus, Portland, Ore.; Baltimore, Brooklyn, San Francisco, Pittsburgh, Detroit, Washington, D. C.; Cleveland, Minneapolis, St. Louis, Philadelphia, Kansas City and Indianapolis.

Queue loading has been found effective in facilitating the loading of cars, but has not been so successful on streets where there is more than one line of cars. Queue loading gives best results when used in connection with multiple-berthing of cars and assisted by front-end collectors. Indorsement of this system is given by the companies in Detroit, Milwaukee, Pittsburgh, Dallas, Portland, Ore.; Philadelphia and Seattle.

Double or multiple berthing is used where cars on close headway stop before crossing an intersection and all proceed on the same signal. The system saves unnecessary steps, speeds up service and reduces congestion. In Pittsburgh and Kansas City berthing spaces are marked by signs suspended from the trolley wires at the exact place where passengers are to board. Used with satisfaction in Seattle, San Francisco, Milwaukee, Boston, Pittsburgh, Washington, D. C.; Minneapolis, Kansas City, Baltimore, Philadelphia, Los Angeles and Indianapolis.

Street collectors or additional men stationed at congested points and terminals to collect fares and so increase the rate of loading, are especially helpful if used with loading platforms or queue loading. One company reports having loaded passengers at a rate twice as fast as where all fares are paid to conductor. Others report a quicker and more even loading of cars with this system. It is especially helpful at stub-terminals in the congested district. One company keeps down the expense for this extra service by using as collectors in rush hours men who work inside other departments during the day. Used successfully in San Francisco, Los Angeles, Seattle, Milwaukee, Boston, Washington, D. C.; Dallas, Kansas City, Chicago and Portland, Ore.

Prepayment areas are used to good advantage in Boston, where the company has purchased property at several points where rapid transit and surface cars have a common terminal. Persons entering this area pay their fares at a booth and are then ready to board cars without delay. These areas cannot be installed, to any great extent, on public property in traffic centers.

Traffic Regulations: Street cars can serve the community best when given a clear right of way. This can be assisted by prohibiting parking of vehicles along car routes in congested districts at least during the rush hours, limiting the parking to thirty minutes during other hours, forbidding coal deliveries along car lines during the day and restricting parades to certain streets. The day may come when other vehicles will not use car tracks in any part of the city, and thus a better schedule speed can be maintained throughout the system. Traffic ordinances will not clear the tracks unless enforced by police and courts. A further improvement can be secured by adopting a rail head which does not provide a guide for vehicle wheels. Beneficial results with police co-operation have been secured in Chicago, Milwaukee, Boston, Portland, Ore.; Baltimore, Brooklyn, Los Angeles, Seattle, Pittsburgh, Cleveland, Kansas City, Washington, D. C., and Columbus.

Other topics considered were: elimination of loops in congested districts, turnbacks outside of congested districts, elimination of left-hand turns, one-way streets, segregation of vehicle traffic, semaphore control of traffic, location of passenger stops, reduced number of positive stops, staggered hours, trailer cars and jitney control.

The report is signed by Edward Dana, chairman; J. M. Campbell, Donald Goodrich, E. H. Ives, B. F. Jacobs, H. C. Moser, A. G. Neal, Harold A. Otis, Samuel Riddle, Walter Schroyer and J. A. Stoll.

There were two prepared discussions, one by John A. Beeler, New York, and the other by Albert S. Richey, Worcester.

In discussing the report of the committee John A. Beeler, New York, said: The definitions of schedule terms have been needed for many years, as it is difficult to compare companies reporting scheduled hours in different terms. The careful research made by the committee of handling traffic in congested centers indicates that the specified means for relieving congestion are giving good results where they are properly applied, and the recommendation that these various methods be applied elsewhere to facilitate street car operation and eliminate congestion is a sound one.

While the subject of traffic regulations is stated by the committee to be somewhat outside the scope of its investigation, it is pointed out that such things as prohibition of parking, elimination of left-hand turns, use of one-way streets, segregation of vehicle traffic, semaphore control of traffic, etc., have a marked bearing on schedules. in fact, everything that clears the way for the passage of a street car must assist in keeping not only the cars but all traffic moving. Enterprising city governments are now realizing this and are in many instances inaugurating such regulations. In other cities quasi-public bodies like chambers of commerce are working along similar lines.

In inaugurating the innovations mentioned in the report the railway operator is sure to meet with a discussion regarding the effect on safety. He should emphasize that speeding up traffic movement is not done by running the cars at a breakneck pace, but by eliminating time that traffic is standing motionless. Streets relieved of congestion have proved themselves much safer than those clogged with jammed, slow-moving traffic.

The installation of loading platforms may in itself appear a matter of little consequence, but they can be used to advantage to concentrate the riders right where they will board the cars, and at the same time they provide a safe waiting place out of the street traffic. Platforms also facilitate loading by decreasing the physical effort to board the car. Their use presents advantages to the car riders even greater than those cited for a bus loading at the curb. Not only do loading platforms speed up street car movements but they assist in the movement of traffic generally.

Double berthing, or cutting out the waste time at stopping places, speeds up schedules and tends to greater regularity of service. The second berth may be used very little save in emergencies, for with greater regularity of car movements the number of times that a car is delayed by the one immediately ahead is reduced. This result,

of course, is not obtained if the mistake is made of stopping the car at both berths.

Elimination of left-hand turns has transformed some of the most complicated and difficult traffic corners in the United States to quiet and orderly intersections, although there may be more traffic moving straight ahead than formerly. The exact location of car stops at junction points is of great importance, as they should be placed not only to prevent street car interference but to reduce interference with general traffic as well.

The use of street collectors is a courtesy extended by the company to the public that results in faster and more even loading of cars. It conserves the time of the public while saving money for the company.

Routing is a subject of tremendous importance. A change in downtown routing may enlarge the delivery district and at the same time reduce the number of cars at congested points. This is of great advantage to both public and the company. These methods all eliminate waste motion and lost time for the passengers, which incidentally saves time for the company and results in faster schedules. Relatively unimportant as any one of them may appear individually, many a company has been saved from bankruptcy by an increase in speed of less than a mile an hour.

A note of caution is not out of place against indiscriminate application of these remedies for improving traffic conditions without a thorough analysis of the causes of the existing congestion. After a correct diagnosis of the case a forecast should be made of the results of applying each of the remedies enumerated. It is my experience that certain and frequently all of these means are applicable for the betterment of the general traffic situation in any community where the changes are properly inaugurated and the right kind of publicity obtained.

The phases of street railway operation covered by this report offer greater opportunities for reducing operating expenses that any others I know. In one large city that conducted a campaign of this nature the result was not only to popularize the service but to increase the net income a million dollars a year. Capitalized at 10 per cent, this is equivalent to adding $10,000,000 to the value of the property.

A. S. Richey, Worcester, Mass., the next speaker, congratulated the committee on its report and called attention to the fact that the committee had well defined the four constituent parts of car-hours, namely, running time, layover time, runoff time and excess time, but had not given an exact definition of the term "car-hours." He mentioned the difficulty which is experienced in comparing the schedule speed of two roads unless the method of reporting car-hours is definitely known. He suggested that in addition to the four definitions relating to car-hours recommended by the committee the association adopt a fifth defining car-hours as the total time embraced in the four as stated.

Following these two statements the discussion of the report was opened to the floor of the convention. Alexander Jackson, Public Service Railway, stated he believed the four definitions relative to car-hours as well as those for platform time and report time conflicted with those submitted in 1914 by the then committee on definitions. He read the 1914 definitions to substantiate his position.

It was pointed out by W. B. Wheeler, Third Avenue Railway, New York, that the definition for running time, while using different words, meant the same as the 1914 definitions. It was not feasible, F. R. Cogswell, Pittsburgh Railways, stated, to separate runoff time when cars returned through a territory that offered good business. Chairman Dana pointed out that runoff time was to be used only when cars were not engaged in revenue service. In the case outlined by Mr. Cogswell such time would be a part of the running time.

On motion by J. V. Sullivan, Chicago, it was voted that hereafter when asking for car-hour figures for comparative purposes they be figured so as to include the four parts suggested by the committee in its definitions. The four definitions as to the division of car-hours and the eight applying to man-hours were approved.

In discussing variable running time F. R. Cogswell, Pittsburgh, stated that on his property if a man works a run that is made up of two pieces, each on a separate car, the time intervening between the two pieces must be paid for. He also stated that due to the narrow Pittsburgh streets the loading platforms necessarily had to be narrow and that as a result queue loading automatically resulted. If passengers do not follow this plan they cannot get on the cars.

On the Third Avenue Railroad W. B. Wheeler stated that the running time was varied according to the degree of congestion. This was especially true of the so-called owl car service. Due to the large amount of single track and division lines it was not possible to change the running time very frequently, and then, too, to do so put a burden on the schedule makers. In Pittsburgh it was pointed out by F. R. Cogswell that the running times were changed five times daily, that is for the morning peak, mid-day, evening rush hour, evening and for owl service. In summer on the heavy traffic lines there is perhaps more layover time in the rush-hour schedule than during the winter. On the light traffic lines nothing but a uniform schedule is maintained.

In Baltimore, according to J. H. Stoll, variable running time has been applied to many lines. On the heavy traffic lines there are five or six changes a day, while on the crosstown and light traffic routes there are but two changes. These changes have effected a real saving in the number of cars and car-hours operated and have also materially speeded up the system. It has also had a good effect upon the car rider for it enables him to get to his destination quicker, and so far as car operation is concerned it takes up the slack during certain hours. Variable running time should also be carefully considered.

In Youngstown, Ohio, as pointed out by C. D. Smith, this method of schedule making is followed on both the urban and interurban routes. It has developed that if schedules were not changed the men would do it themselves so as to get more layover time. He believed it best to study schedule conditions as operated and make at least four changes in running time, thereby making a saving in cars operated.

C. E. Morgan, Brooklyn, agreed in the necessity of having variable running times. He told how the traffic on each line must be continually analyzed for the full twenty-four hours of the day and that if it were not done those who were in charge of operation were not serving the company in the way they should. It pays to add schedule makers and to change schedules even as frequently as sixty to ninety days. The only way to make any profit in the railway is to keep the wheels turning. Factors that enter into schedules are demand and units of operation, either single cars or trains, and as traffic thins out to take off or turn back cars at specific points. His studies had enabled him materially to better handle the traffic with a lesser number of cars. On single-track turnout lines it is possible to speed up by spreading out the meeting points. It is the net results that should be looked out for and not the mere fact that an expenditure has to be made to accomplish the desired result. The point to be looked out for is an increase in the number of passengers per seat-mile and to eliminate all unnecessary car-miles.

FREIGHT ACCOUNTING

The second report presented at the joint meeting was on freight accounting. The report stated in part:

This tentative classification and system of freight accounting for electric railroad corporations is made with the hope of filling a long felt need for a system which would give an accurate record of the results from the operation of freight business. It is so prescribed that any corporation, by keeping on its books the accounts prescribed by the Interstate Commerce Commission can carry out this system with very little additional labor and expense. In most cases the accounts of this classification, were different from those prescribed by the I. C. C., are merely groups of several accounts of the latter.

In order that uniformity in the ap-

plication of the provisions of this system may be secured the accounting officers are requested to submit all questions of doubtful interpretation to the joint committee on freight promotion and costs, as appointed by the American Electric Railway Association, for its consideration and decision.

WAY AND STRUCTURES

Maintenance of Track, Overhead, Etc. (1-23). — This account shall include a proportion of the cost of maintenance, including supervision of roadway, track, bridges, signals, telephone lines, distribution system and all miscellaneous way and structures expenses as shown in the uniform system of accounts, numbered from 1 to 23 inclusive. This account shall be charged with the proportion that the freight car-miles bear to the total car-miles operated.

Buildings and Fixtures (24). — This account shall include the cost of labor and material used in repairing freight stations, platforms and all other freight structures; also a proportion of the cost of repairing jointly used carhouses, shops, offices and other buildings, same to be proportioned on use or car-mile basis.

Depreciation of Freight Buildings and Structures (25). — This account shall include the amount set aside to provide a reserve for the retirement of freight stations, platforms and other freight structures.

EQUIPMENT

Repairs to Freight Cars (31, 33).— This account shall include the cost of all labor and material used in repairing bodies, trucks and electrical equipment of freight cars.

Repairs to Service Equipment (32).— This account shall include a proportion of the cost of repairing service cars, including line cars, snow plows, sweepers, etc., same to be proportioned on the car-mile basis.

Repairs to Locomotives (34). — This account shall include the cost of labor and material used in repairing locomotives. This includes repairs to bodies and trucks and all fixtures and appliances inside and outside of bodies and trucks including electric motive equipment of locomotives.

Miscellaneous Shop Expenses (29, 36, 37, 39).—This account shall include a proportion of the cost of shop supervision, repair to shop equipment, cost of heating shops and other miscellaneous shop expenses, same to be proportioned on use or car-mile basis.

Depreciation of Freight Equipment (40). — This account shall include the amount set aside to provide a reserve for the retirement of freight equipment.

POWER

Power Delivered to Cars (45-62).— This account shall include the total cost of power, including generating, converting or the amount paid for power purchased and all expenses incident to delivery of power to cars. Where power is purchased give details including cost per kilowatt-hour. Where trail cars are hauled add 25 per cent additional for each car.

CONDUCTING TRANSPORTATION

Freight Trainmen (65). — This account shall include the wages of motormen, conductors and other trainmen engaged in freight service.

Station Employees and Expenses (68, 69).—This account shall include wages of agents, warehousemen and others employed in freight stations; also the cost of heating and lighting stations and other miscellaneous freight house expenses.

Freight Collection and Delivery (38, 76, 96).—This account shall include the wages of chauffeurs, drivers and helpers employed on wagons or other vehicles, used for collection or delivery of freight. This account shall also include the cost of repairing wagons, harness, trucks and all garage and stable expenses incidental to maintenance of wagon or truck delivery service in connection with the freight business.

Loss and Damage (77). — This account shall include the expenses incurred for losses and damages to freight intrusted to the carrier for transportation, also cost of settling such claims.

Miscellaneous Car Service Expenses (67). — This account shall include miscellaneous expenses for car and locomotives, such as lubricants, waste, carbons for headlights and other supplies except such as are used for repairs.

Carhouse Employees (70).—This account shall include the wages paid car, motor and brake inspectors and other carhouse employees not engaged in making repairs.

Miscellaneous Transportation Expenses (63, 66, 71, 72, 73, 78). — This account shall include a proportion of the cost of superintendence of transportation, operation of signals and telephone lines and other miscellaneous car service and transportation expenses, same to be charged on the car-mile basis.

TRAFFIC

Solicitation of Freight (79). — This account shall include the salaries and expenses of freight solicitors and clerks.

Advertising (80).—This account shall include the salaries and expenses of advertising agents, the cost of printing and distributing timetables, folders, notices to shippers and all other freight advertising matter; also freight advertising in newspapers and magazines.

Miscellaneous Traffic Expenses (82). —This account shall include miscellaneous traffic expenses of the freight department.

GENERAL AND MISCELLANEOUS

Officers, Clerks and Miscellaneous General Expenses (83-91, 95). — This account shall include a proportion of the salaries and expenses of general officers and clerks, law expenses, stores expenses and miscellaneous general office supplies and expenses, the charge to be made on the basis of gross earnings.

Accidents and Damages (92). — This account shall be charged with salaries and expenses of claim agents and attorneys and amounts paid in settling claims of accidents arising from the operation of freight cars.

Insurance (93). — This account shall include premiums paid for insurance on freight buildings and equipment, also premiums paid on freight in freight houses and in transit.

FREIGHT DEPARTMENT—REPORT OF EARNINGS, EXPENSES AND STATISTICS

SUMMARY OF OPERATIONS

Earnings	Month of	This year to date	Last year to date
Freight (car load).			
Freight (less car load).			
Milk and cream.			
Other revenue.			
Gross Earnings—operating expenses.			

Ways and structures: Accounts	(Note)
Maintenance of track, overhead, etc. 1-23	(B)
Maintenance of buildings and structures 24	(A)
Depreciation of freight buildings 25	(A)
Equipment:	
Repairs to freight cars 31, 33	(A)
Repairs to service equipment 32	(B)
Repairs to locomotives 34	(A)
Miscellaneous shop expenses 29, 36, 37, 39	(B)
Depreciation freight equipment 40	(A)
Power:	
Power delivered to cars 45-62	(A)
Conducting transportation:	
Freight trainmen 65	(A)
Station employees and expenses 68, 69	(A)
Freight collection and delivery 38, 76, 96	(A)
Loss and damage 77	(A)
Miscellaneous car service expenses 67	(A)
Car house employees 70	(A)
Miscellaneous trans. expense 63, 66, 71, 72, 73, 78	(B)
Traffic:	
Solicitation of freight 79	(A)
Advertising 80	(A)
Miscellaneous traffic expenses 82	(A)

General and miscellaneous: Accounts	(Note)
Officers, clerks and miscellaneous general expenses 83-91, 95	(C)
Accidents and damages 92	(A)
Insurance 93	(A)
Stationery and printing 94	(A)
Rent of tracks and facilities 97	(A)
Rent of equipment 98	(A)
Total operating expenses	
Taxes	(A & C)
Income less operating expenses and taxes	
Interest	
Net income	

Note—Proportioned—A=actual, B=car-mile basis, C=gross earnings basis.

FREIGHT STATISTICS

Passenger car-miles operated
Total freight motor car-miles operated
  Miles loaded cars
  Miles empty cars
Total freight trail car-miles operated
  Miles loaded cars
  Miles empty cars
Total milk car-miles operated
  Miles loaded motor cars
  Miles loaded trail cars
  Miles empty motor cars
  Miles empty trail cars
Total freight locomotive-miles operated
Total tons carload revenue freight handled
Total tons less carload revenue freight handled
Total tons non-revenue freight handled
Total train-miles operated
Average cars per train
Freight revenue per ton per mile
Tonnage handled and expense at principal freight terminal
Tonnage handled and expense at average station
Number of miles road operated
  Single track
  Double track

Stationery and Printing (94).—This account shall include the cost of printing freight bills, waybills, milk tickets and other freight printing; also the

cost of stationery and postage used by the freight department.

Rent of Tracks and Facilities (97).— This account shall include the amounts paid for rent or use of tracks and facilities by the freight department.

Rent of Equipment (98).— This account shall include the payments to other companies for rent or use of freight cars and equipment.

TAXES

This account shall include gross earnings and income taxes based upon the gross and net earnings of the freight department; also a proportion of all other taxes, same to be proportioned on the gross earnings basis.

INTEREST

This account should be charged with the interest on equipment and facilities used exclusively for freight business, at the same ratio that the general mortgage or indebtedness bears to the total value of the railroad property covered by the mortgage. For example: If the total value of the railroad, as covered by the mortgage, amounts to $15,000,000,000 and the mortgage amounts to $5,000,000 at 5 per cent and the value of the equipment used exclusively for freight is $100,000; interest at 5 per cent per annum should be charged on one-third of $100,000, as in this case the railroad property is mortgaged for one-third of its book value. This account should also be charged with interest on any loans made for the purchase of freight buildings or equipment, not covered by the mortgage.

The above plan is suggested, but if any other basis is used give details. The distribution of operating expenses, taxes and interest will not be exactly the same on all roads but the fundamentals as set up in this system of accounts will give the cost of operation of the freight business from which we can obtain valuable information.

The report was signed by the two chairmen, F. W. Coen for the T. & T. Association and L. T. Hixson for the Accountants' Association.

DISCUSSION ON FREIGHT ACCOUNTING

In presenting the report of the joint committee on express and freight traffic promotion and costs, F. W. Coen, Cleveland, chairman, submitted a complete tentative system of freight accounting and a compilation of freight statistics from eleven Mid-West companies, which latter, however, he rather completely discredited for any valuable purpose because of many impossible figures submitted. He explained, for example, that the figures were not segregated as between motor and trail car-miles and that no division was made between carload and l.c.l. car-miles. He cited several other discrepancies from what must evidently be the true figure.

R. N. Graham, Youngstown, commented that the present I. C. C. accounting system provides but three freight accounts, one covering maintenance of freight cars, on the wages of motormen and conductors used on freight equipment and the third covering losses and damages resulting from freight claims. He pointed out the many ways in which this system is inadequate in determining the cost of freight service and expressed the opinion that the systems of accounting generally in use are exceedingly inadequate. For example, the segregation of maintenance cost of freight cars was no more important than the segregation of maintenance of electrical equipment used in freight service, or of the accidents involving freight equipment, etc. He maintained there was nothing to be gained by carrying freight at a loss and that the only way that it will be possible to determine whether this business is profitable or not is through the adoption of a complete system of accounting. As to the car-mile basis for the freight accounting system, he thought it was certainly not unfair to the freight business and probably favored it, because of the relatively higher maintenance costs involved in connection with operating freight equipment as compared to passenger equipment.

L. T. Hixson, Indianapolis, co-chairman of the joint committee, forwarded a letter which was read in his absence in which he maintained that the use of the ton-mile unit would be better than the car-mile basis recommended by the committee, and giving reasons for his contention.

G. T. Seely, Youngstown, pointed out that there were two important reasons for establishing a proper system of freight accounting. The first was for the purpose of determining the actual expense in order to find out whether a company is actually losing money in giving freight service, taking into consideration that the roadbed is already there. The second reason was for its value in determining whether the rates were proper, when taking into account not only the interest on the actual investment in freight equipment, but including also a proper proportion of the carrying charges on the investment in other equipment used.

F. D. Norviel, Anderson, Ind., pointed out that in 1911 a similar committee had made virtually these same recommendations as to accounting, but that the industry was just about as far along today as it was ten years ago in this matter. He said that the Union Traction Company of Indiana is using a system of accounting practically the same as was recommended by the association some years ago and that by this means it has been possible to arrive at a sufficiently accurate cost of freight service to make the statement that this business offered an opportunity for profit to electric railway companies.

Mr. Seely, in order to bring the matter to a head and avoid further delay in establishing a proper system of freight accounting, made the motion that the association adopt the classification of accounts as submitted by the committee and recommend that all companies put it into effect. He explained that even though this might not be the best system of accounting it would be better to put it into operation and try it out for one or two years, after which there would be a much better idea of its value or what changes should be made. The motion was passed after some discussion as to whether it was advisable to adopt this system in view of the difference of opinion expressed by the letter from Mr. Hixson on the use of the ton-mile or car-mile unit. Mr. Coen brought out that this matter had been thoroughly considered by the committee with Mr. Hixson in attendance.

C. E. Morgan, Brooklyn, moved that the association send out a notice to a high official of every member company urging that he take steps to have this system of accounting started on Jan. 1, 1922, in order to insure a comprehensive trial.

The meeting then adjourned.

Thursday's Session

At the closing session of the Transportation & Traffic Association convention, held on Thursday afternoon, the report of the committee on personnel and training of transportation employees was read by James P. Barnes, Louisville Railway, chairman. This, in abstract, was as follows:

PERSONNEL AND TRAINING OF TRANSPORTATION DEPARTMENT EMPLOYEES

The report covered specifically the matter of employment, and consideration of the proper training after employment was left for future committees. The committee's recommendations may be summarized thus:

1. All applicants for employment as trainmen should be received under uniform conditions and subjected to preliminary tests and, so far as possible, be interviewed in each instance by the same person. The preliminary stages of employment, which may be covered either verbally or by a written form, should be in the nature of elimination tests and should embody a general examination of the candidates for mental alertness, answering questions and his ability to execute simple instructions promptly and correctly. There should be a preliminary test of sight and hearing designed to eliminate candidates who are already "hard of hearing" "color blind," "short-sighted" or suffering from similar defects of sight or hearing. The preliminary test should be applied only as a basis of rejection and the test should be designed to eliminate the unfit.

2. Those who are found fit should be asked to fill out an application blank, each candidate in his own handwriting and preferably at the employment office under observation. The blank should include such additional questions as local conditions may require, but should cover certain minimum requirements specified in the report.

3. When vacancies are to be filled selection should be made from the appli-

cations on file, based on the information already obtained in the preliminary examination, application blank and references. The candidate chosen should be required to undergo a physical examination.

4. After the applicant has satisfactorily passed the preliminary and medical examinations, a general talk should be given by the employment agent, including presentation and preliminary instruction on operating and safety rules with the presentation of the student badge and instruction book.

5. The applicant should be personally introduced to the instructor or chief motorman or conductor who is to follow the detail of his "breaking in" on various lines, and this man in turn should personally introduce him to such of the instructing motormen or conductors as he is to operate with.

6. Following the "breaking in" on cars, there should be a brief and general instruction on a car or in the shop on mechanical and electrical principles of the equipment. This instruction should be brief and hit the high spots only, as it is felt that an attempt to crowd too much into this course merely bewilders the candidate and results in adding to, rather than decreasing, his troubles.

7. A written examination (questions to be changed at intervals) should be given at the end of the "breaking in" period on operating rules and such other matters as need to be covered, to be followed by a final talk from the head of the department on observation of rules, personal conduct, safety matters, accident prevention, etc., which talk will include some form of cross-examination on rules.

8. The new employee should be taken by the superintendent or assistant superintendent, where this is practicable, to the carhouse where he is to work and there personally introduced to the carhouse foreman, under whose authority he is to be placed.

9. At the end of the probationary period, the new employee should be brought in for oral examination as to rules, operating conditions, etc, and further instruction on personal bearing, accident prevention and similar matters.

10. The old men should be re-examined physically and on rules at intervals of not more than five years.

The report was signed by James P. Barnes, chairman; F. G Buffe, F. D. Burpee, F. L. Butler, Dr. John Leeming, A. P. Norris, Martin Schreiber, F. J. Trazzare and J. E. Wayne.

Report on Employee Selection and Training Discussed

In discussing the report of the committee on personnel and training of transportation employees Dr. John Leeming, medical counsel Chicago Surface Lines, explained in detail some of the considerations involved in the report. He said that an intelligent employment man should easily be able to discover at the first meeting if an applicant is mentally dull, hard of hearing, color blind, short-sighted, deformed, etc.; in other words, plainly unfit for the service. A physical examination by a competent medical man is of great importance and essential before employment. A mental examination in the form of intelligence tests is also desirable. This will satisfy the medical examiner that the proposed employee is possessed of a fair degree of intelligence and mental ability.

Dr. Leeming said that while valuable mechanical devices have been contrived with the object of enabling the examiners to ascertain the mental ability of the applicant for quick appreciation and ready response to unusual situations suddenly presented, the information in regard to the intelligence status of an applicant may be obtained in a satisfactory manner by a competent examiner, who is fairly well posted on the principles of practical psychology, without the aid of any mechanical device. Such an examiner need not necessarily be a physician. This work might properly be handled by a trained and expert employment man, working in co-operation with the medical examiner, superintendent of transportation and general manager. Tests should be used which will indicate the applicant's powers of memory, attention, perception, adaptation, judgment (of forms, weights, measurements, etc.) and his readiness, accuracy and speed in voluntary motor response to mental impressions.

In regard to the importance of thorough medical examination, Dr. Leeming said that while the committee made only a modest recommendation in the form of a minimum requirement, some of its members favored a much more thorough examination than the report indicates. He said that of late years he had had opportunity to observe the benefits derived from a thorough mental and physical examination which eliminated approximately 10 per cent of the men who had previously passed the preliminary interview by the employment man.

The committee's last recommendation, that "old" men be re-examined physically and on rules at intervals of not more than five years was treated by Dr. Leeming in detail. The most complicated piece of mechanism, he said, that is used in running a street car is the human machine, and he, like other machines, will get out of order. Comparing the human machine to a bridge, he pointed out that it would not be safe to say: "This has been a good faithful bridge and has carried our cars and our passengers safely over it for many years. I notice its timbers are showing signs of dry rot, but it seems to be doing the work all right, therefore I will not go to the trouble and expense of examining it. I will take a chance with it." Even if there is no visible evidence of dry rot or any other surface indications of defect it is the engineer's duty to have every detail carefully and repeatedly examined and elements of weakness removed. If an old employee is disqualified he cannot be used, but maybe his disqualification is not so complete but that he may be safely used in some work other than that of trainman. If so he should receive preference. But if on re-examination a motorman is found to have positively disqualifying defects, he should be removed and not be permitted to endanger the lives of passengers.

This re-examination, said Dr. Leeming in conclusion, might in many cases be valuable to the employee, in disclosing partial and only slightly disqualifying defects, which in many cases could be benefited by advice and suitable treatment. Then, again, a motorman with slight ailments might be changed to a less hazardous run on outlying crosstown lines, or, in some cases a motorman might be made a conductor.

To use a mechanical analogy, if a company has a car, a rail or a signal which can no longer be used under the legal requirements of the highest degree of care and safety, it must be either repaired or used in some part of the service where it is not an element of danger. This is equally true of a trainman. It would be no answer whatever to a failure in duty in this regard to say that an unsafe employee is continued in his work because of his past service, however long or excellent, or because of his financial circumstances, however bad.

Henry H. Norris, ELECTRIC RAILWAY JOURNAL, abstracted his paper bearing on this subject. It appears in abstract earlier in this issue. He was followed by Robert L. Wilson, works manager Westinghouse Electric & Manufacturing Company. Mr. Wilson said that the committee was to be congratulated on the sound and definite recommendation presented. Physical examination, he said, is of great importance. In his company the most difficulty is experienced in determining how far to go in the re-examination of old employees. There is often opposition encountered both from the employees and from outside organizations.

The substance of the report of the committee, said Mr. Wilson, may be divided under the following subheads: (1) central employment department, or uniform methods; (2) application forms; (3) selection and physical examination; (4) preliminary instruction and explanation; (5) introduction of new employees; (6) detail instruction or breaking in; (7) examination.

Under the first head it may be said that success will depend not so much upon an specific method as upon the personality of those carrying on the work.

In the Westinghouse works the central employment department has been divided as follows: general division, men's division, women's industrial division, women's clerical division, statistical division, personal service division.

Under the second subhead, the ap-

plication form is important, and under the third it may be said that in an industrial organization personal records are not given much attention. Applicants should be put through a preliminary "weeding out" process. In the interview which follows the filling in of an application form the success or failure of the employment function occurs. The interviewer must remember that he is selecting an employee, not alone for his ability to perform some manual work or for his intelligence, but he must consider what kind of a "front" the applicant can put up.

In this connection, said Mr. Wilson, the so-called psychological and intelligence tests should be used only by those of large experience. Each applicant accepted by the interviewer should be given a thorough physical examination, both as a safeguard to his prospective fellow employees and to insure his not being put on work unsuited to his strength.

Under the remaining subheads Mr. Wilson said that the employing officer should make the new employee feel that the railway is a desirable concern to work for. Any time taken in introducing him to his work and his fellows will be well repaid.

By way of summary, Mr. Wilson said that a well-organized personnel or employment department is about as valuable as any other one department to any large enterprise. In one thing, it should lessen labor turnover by substituting well-thought-out policies for haphazard selection and practices. It first sells the company to the employees and they, in turn, do a great deal in fostering a public opinion favorable to the enterprise. To deal fairly with employees it is necessary to know something about them as individuals; their skill, dependability, personality, length of service, etc. Hence, well-balanced records are kept by the employment department. It is necessary that petty injustices be corrected, and the employment department furnishes a good place to which a man can bring a real or fancied grievance for adjustment without fear of prejudicing his standing.

L. H. Palmer Elected President

At the close of the session the report of the nominating committee was presented by W. H. Sawyer, East St. Louis, Ill., and the report was accepted, thus electing the following: President, L. H. Palmer, assistant to the president United Railways & Electric Compan, Baltimore, Md.; first vice-president, G. T. Seely, Youngstown, Ohio; second vice-president, J. K. Punderford, New Haven Conn.; third vice-president, Arthur Gaboury, Montreal, Que.; executive committee, G. H. Clifford, Fort Worth, Tex.; T. C. Cherry, Syracuse, N. Y.; J. V. Sullivan, Chicago, Ill.; Edward Dana, Boston, Mass.

W. H. Boyce, New Brighton, Pa., then presented the report of the committee on resolutions, which was accepted. In addition to expressions of appreciation for the several factors which had made the convention a success, a resolution of regret for the death of President J. J. Landers of the Accountants' Association was included. Mention was also made of the services of the technical press to the association. The report of the committee on personnel and training of transportation employees, with its ten recommendations, was then accepted; the president and first vice-president elect were introduced, and the meeting was adjourned.

Care in Construction and Maintenance of Overhead Lines*

Every Employee Should Take an Active Part in Establishing and Maintaining Safe Working Conditions—Much of the Danger on High-Tension Lines Due to Man-Failure

By A. B. Gates

Superintendent of Overhead Lines Commonwealth Edison Company, Boston, Mass.

IN THE early days of electrical distribution poles were erected and wires attached to these poles, with no thought as to the safety of the lineman who later must handle these wires while they were alive. As the distribution systems grew and more circuits were needed wires were added until the poles were so congested that linemen in ascending or descending were forced to climb out around the ends of the arms.

But changing times have changed conditions and we find that overhead line structures are now designed with considerable thought for the safety of the workmen, safe working methods are being established and every effort is being made to insure a proper attitude on the part of the linemen toward safety work.

In the design of overhead lines or structures the first consideration should be the strength of the structure. It must have a sufficient factor of safety to withstand any stress to which it may reasonably be expected to be subjected, and, secondly, it must be simple and so arranged that the conductors and equipment may be supported in a manner such that the workmen can ascend or descend the pole or structure without danger of accidentally coming in contact with the live conductors or equipment.

All conducting material, such as braces, transformer cases, bolts and guys not permanently and intentionally grounded, must be installed so as not to be in contact with grounded or live wires. The climbing space must always be kept clear of guy wires, live or grounded wires, as well as cable lateral pipes, transformer cases or other equipment.

Keep Tools in Good Condition

The most essential contribution to safe working methods in line work is satisfactory tools and equipment. Ropes must be free from metal strands and when worn they must be replaced. Cutting tools must be sharp and provided with suitable handles or holders, chisels, bars, wedges, hammers and star drills must be faced and free from mushroomed heads. Wrenches must be carefully inspected and repaired or junked when the jaws become worn or sprung. Every workman who is required to work on or near live wires should be provided with rubber gloves and every crew should be provided with a sufficient number of insulating covers so that all live or grounded wires or conducting material with which the workmen can possibly come in contact while working on or near live primaries can be covered.

As far as possible methods of doing standard work should be systematized and working rules should be established so as to insure uniform practice in all gangs. In addition to the working rules or standards a complete set of safety rules should be established, kept up to date and enforced. All conductors not known to be dead should be considered alive and when men are working on or near live wires all other conducting material with which the workmen may come in contact should be covered. No workman should be allowed to handle live conductors with rubber gloves only as protection on circuits of over 4,000 volts. If overhead line repair or construction work is to be done on live lines of over 4,000 volts high-tension tools of proper and safe design should be used.

Whenever a high-voltage line is killed to be worked on it should be grounded before it is turned over to the line crew, and in addition the line crew should put a ground on the line by means of a chain attached to the ground wire, if there is one on the structure, or to a pipe or rod ground, if no ground wire is available, between the point at which work is to be done and all sources of feed or back feed to that portion of the line. The temporary ground should not be removed until all work at that location is completed.

Whenever possible all circuits and lines should be killed while they are being repaired. In many cases the saving in labor effected by doing the work on dead equipment will more than offset the trouble and expense of taking the equipment out of service, and when the reduction of hazard is considered

*Abstract of an address delivered before the Public Utilities Section, National Safety Council, at the tenth annual Safety Congress, Boston, Mass., Sept. 28.

usually the decision can readily be made in favor of dead work. On our system the customers who are supplied from higher voltage lines—that is, 9,000 volts and above—are practically all provided with more than one source of supply so that we have not found it necessary to use high-tension tools for making line repairs, as usually we have no difficulty in taking a line out of service.

For distribution work we have found that a rubber blanket about 3 ft. square provided with three eyelets along two of its edges and 3 and 4 ft. lengths of ¾-in. garden hose provide the best protection possible while doing live work. Rubber gloves which have been tested for puncture at 5,000 volts are supplied to all workmen who have occasion to work on or near primary wires. These rubber gloves are always worn under a horsehide glove which has a complete palm, thumb and fingers, but has the back removed. The horse-hide glove is short, coming only to the wrist, and is held in place by a wrist strap. For work in rainy or stormy weather all men who do emergency work are provided with rubber coats and three-quarter length or sporting boots.

Our workmen are required to test their gloves by the air pressure method each time before putting them on. The foreman examines all rubber goods, other protective devices and tools at least once each week and in addition a monthly inspection is made by the safety inspector. With all precautions taken, through man failure or other causes, accidents may happen. In order to be sure that we will be prepared to meet such an emergency if it occurs, every member of the overhead line force is required to practice the prone method of resuscitation each week.

Attitude of the Workman Toward Safe Methods

Statistics show that 80 per cent of industrial accidents are caused by man failure; therefore, with the best and safest standards of construction followed rigidly, with the best of tools, equipment and safety equipment provided, and with the best possible working and safety rules drawn up and circulated among the workmen, little can be accomplished unless we can obtain the proper co-operation on the part of the men who are to do the work. The first step in attaining proper attitude toward safety and other established rules is a permanent working force. A premium should be placed on length of service. This can be in one of many forms, rate of pay, disability and death benefits, pension systems or in many privileges which can be made to depend on this factor. But even with all these inducements for continuous service, there will always be a turnover, and the men who leave must be replaced. The line force should be built up from the bottom and as far as possible all vacancies should be filled by promotion and new men hired in the lower grades.

Every groundman should be given a chance to learn. He should be taught the working and safety rules and should be examined as he progresses in the work. No workman should be allowed to climb and do line work until he has proved by examination that he is capable of doing the work of the grade to which he is to be promoted. After he has climbed for some time and is capable of handling himself on the pole and has become familiar with safety and working rules, he should be examined before he is allowed to work on live wires, and after he has worked on live wires under the direction of a lineman or a foreman, he should again be examined before he is promoted to the grade of lineman and is allowed to work on primaries without direct supervision by an experienced lineman or foreman.

If this method is followed no new man will be expected or allowed to do work for which he is not properly trained. Only when it is absolutely necessary should men be hired as linemen, and when so hired they should not be allowed to work without supervision until it has been determined that they are thoroughly familiar with the system and with the methods of doing work.

It should be impressed on every employee, and especially the new employee, that while engaged in his regular duties, which in line work usually require co-operation of the several men who make up the crew or gang, he is his brother's keeper and he must not only care for his personal safety but must so conduct himself in the execution of his particular part of the work that he will not endanger the safety of his fellow workmen.

We have heard many times that the foreman is the key to the safety situation. This is true and we should constantly preach and talk this idea. But let us remember that the real key to the situation in our safety problem is a proper attitude toward safety on the part of every employee who must engage in a line of work which without care is hazardous.

We must perfect our standards of construction from the standpoint of safety. We must provide the workmen with safe tools and equipment, and finally we must convince each member of the line force that he must believe in and practice safe methods before we can allow ourselves to believe that we are exercising care in the construction and maintenance of our overhead lines.

Gear Manufacturers' Association

THE semi-annual fall meeting of the American Gear Manufacturers Association will be held in the Powers Hotel, Rochester, N. Y., on Oct. 13, 14 and 15.

Reports will be offered by the various committees on standardization, and the papers include the following: "Gear Tooth Wear," by S. O. White, Warner Gear Company; "Duraluminum as a Material for Worm and Other Gearing," by R. W. Daniels, Bausch Machine Tool Company; "The Grinding of Gear Teeth," by J. F. Barr, The Gear Grinding Machine Company; "Tooth Forms," by E. W. Miller, Fellows Gear Shaper Company; and "First-Hand Impressions of Europe," by E. S. Sawtelle, Tool Steel Gear & Pinion Company, who has recently returned from an extensive trip through Europe studying conditions there. F. W. Sinram, of the Van Dorn & Dutton Company, Cleveland, is president of the association, and F. D. Hamlin, of the Earle Gear & Machine Company, of Philadelphia, is secretary.

Importance of Claim Department Statistics*

By J. H. Handlon
Claim Agent Market Street Railway, San Francisco, Cal.

INTELLIGENTLY prepared claim department statistics, if readily accessible, can be used most advantageously by a claim agent not only for reference purposes but with the object of comparing present-day records of accidents and their costs with what has been accomplished in the past.

The natural tendency in gathering statistical information is to prepare this information in such detail that the main facts are obscured by the mass of accumulated data. On the other hand, there are claim agents who are content with such meager statistical information as the total number of accidents and the total costs of the same.

Claim department statistics should be so computed that they will promptly show any increase or decrease in any class or classes of accident on any division or line; at any carhouse or on any particular car or type of car; to any individual motorman or conductor, and they should readily reveal any increase or decrease in accident costs. By preparing such figures on a basis of car-miles, or car-hours operated, and passengers carried, many interesting facts are often brought to the surface.

Such a statement furnished at regular and brief intervals to the operating department for each division, carhouse or line has a tendency to create a rivalry between divisions, carhouses or lines, and the company reaps the benefit of that rivalry. It also enables the operating department to maintain a record of the amount each individual employee is costing the company for accidents. Incidental information as to the average number of witnesses obtained per accident and the number of "blind" or unreported accidents is also valuable to the operating department in co-operating with the claims department.

Additional statistics that are of direct benefit to the claim agent relate to the cost of operating the claim department; summarize the work of each of the investigators; give the percentage of accidents that result in claims

*Paper presented before the Pacific Claim Agents' Association at its twelfth annual convention held at Butte, Mont., Aug. 25-27, 1921.

being presented and show the proportion of claims that are rejected or from which litigation arises.

Such figures often guide the claim agent in determining the policies of the claims department. For instance, we undertook the experiment of temporarily abandoning the practice in vogue for years of immediately appraising all damaged automobiles regardless of whether a claim had been filed or how the accident occurred. By keeping a list of automobile accidents that developed into claims we saw the advisability of restricting our appraisals to only those automobiles involved in accidents where the carmen's reports indicated that the responsibility was uncertain or the extent of damage was considerable, or where claim was presented.

The adoption of this policy last year resulted in more than 19 per cent less automobile claims being presented in proportion to the number of automobile accidents that occurred as compared with the preceding year. In other words, we found that by an appraiser making an inquiry the day after the accident as to the extent of the damage to the automobile, owners of automobiles were encouraged to present claims.

The statistical record of pending claims, rejected claims, outlawed claims and litigated cases should serve to indicate to the claim agent any laxity in his work or if he is allowing too many claims to accumulate or suits to be filed. Perhaps his perspective has become so blinded that he is either too severe upon the claimant or too severe upon his own company in the rejection or granting of claims. The records of the department will immediately reflect such an attitude of mind.

In brief, statistics to the claim agent should be what a cost sheet is to a manufacturer, a steam chart and a steam gage to an engineer and a balance sheet to a banker. For is it not vital to claim agents to know the cost of their department, the work the department is doing, any fluctuations in that work and the stock of accidents on hand? Like a stethoscope, claim department statistics should disclose the heart beats of the department.

Investment Bankers' Association of America

The tenth annual convention of the Investment Bankers' Association of America will be held in New Orleans Oct. 30-Nov. 2. Headquarters will be at the St. Charles Hotel.

Illinois Association to Meet at Aurora on Oct. 14

The Illinois Electric Railway Association will meet at Aurora, Ill., Friday, Oct. 14. A special train over the Aurora, Elgin & Chicago Railroad will leave the Wells Street Terminal, Chicago, at 7:55 a.m., Central Standard time. A very interesting program is assured by Secretary R. V. Prather. This is the first meeting of the association since last fall. A full attendance is urged.

American Association News

More About Des Moines

In an article to be published in *The Nation's Business* for October, President P. H. Gadsden tells the story of the cessation of street car service in Des Moines, Iowa. He also tells something of the attempts the buses made to give service and points out the lack of substantial propositions by the bus interests to take over the transportation responsibilities. The title of the article is "The City Without a Street Car."

Meeting of the Executive Committee, American Association

THE Executive Committee of the American Association held its regular annual pre-convention meeting on Monday morning, Oct. 3. Among the matters before the committee was the resignation of Philip J. Kealy, second vice-president of the association, which had been accepted by President Gadsden at the time it was presented. This action was approved by the committee. Mr. Kealy said that his business interests were such that he could not continue to devote necessary attention to association affairs.

The committee authorized a special resolution with reference to the death of J. J. Landers, president of the Accountants' Association and member of the executive committee.

The committee considered the manner in which the W. O. Gibson case had been concluded and approved President Gadsden's action in making the agreement he had, which resulted in the parole sentence already referred to in these columns.

A special report from the electrolysis committee was given by W. J. Harvie, chairman. The executive committee approved this report, which included a recommendation for continued co-operation with the American Committee on Electrolysis, and also included a recommendation that $2,500 be appropriated by the American Association toward the expenses of the American committee, this being contingent upon similar action by the other associations represented on the committee.

Two subjects were brought up by the Committee on National Relations. One of these had to do with what policy the association had to follow in connection with the present case of the Washington Railway & Electric Company before the Interstate Commerce Commission, in which case the subject of the commission's authority over depreciated figures is in question as against the authority of the District and Maryland Commissions. No definite action was taken. The other question had to do with a situation which is at present facing a large number of electric railway companies in connection with excess profits tax. It appears that the Internal Revenue Bureau has decreased, by a very considerable amount, the investment figure of several railways for the 1917 income tax returns and this has in some cases placed the railways in the excess profits bracket, making them liable for payments ranging as high as $250,000. It is apparently a question of discretion in interpretation of the law and a special committee of five was authorized to consider the special problems and interpretations which might affect the electric railways as a whole in this important matter of taxation.

The committee adjourned after disposing of the usual routine matters and reports.

First Meeting of New Executive Committee

IMMEDIATELY after the close of the American Convention on Thursday noon the new president, R. I. Todd, called the newly elected executive committee into session with the following members present: Messrs. Ely, Harries, Henry, Gadsden, Todd, Budd, Shannahan, Coates, Stevens, Sawyer, Tontrup, Gould, Barry, Ellicott, Secretary Welsh and L. H. Palmer of Baltimore and H. V. Bozell of New York.

The committee took several steps which were necessary in order to start the machinery under the newly revised constitution, such as to authorize the executive secretary and treasurer to pay off ordinary routine office expenses, make provision for convention expenses, for protection of association property, etc.

The committee decided tentatively that its regular meeting shall be on the last Friday of each month except in November, which would make the meeting date fall on the day after Thanksgiving Day. The first meeting will thus be held on Friday, Oct. 28, and will be at the New York headquarters of the association.

A special vote of appreciation to President Gadsden for the energy and self-denial with which he had shouldered the difficult tasks subsequent to the defalcation was adopted.

The executive committee discussed the work of the publicity men and decided to do something to make this part of railway activity more effective. On motion of Mr. Budd the executive committee decided to communicate with the principal executives in companies which are not now engaged in publicity work asking them to pull together with the rest of the association in the general policy of railway publicity in the interests of the industry.

Mr. Todd appointed a finance committee of J. H. Pardee, chairman; R. P. Stevens and J. G. Barry, this committee becoming active immediately in order that the association machinery may not be held up due to lack of direct control over expenses which the finance committee exercises under the new constitution that was adopted at the annual convention.

News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Schenectady Award Ruinous

James F. Hamilton, president of the Schenectady (N. Y.) Railway, and H. B. Weatherwax, vice-president and general manager, when interviewed by the correspondent of the ELECTRIC RAILWAY JOURNAL at Albany in connection with the recent arbitration award between the Schenectady Railway and the Amalgamated Association, made the following statement:

The purpose of the arbitration was to determine a fair and reasonable rate of wage to be paid the members of the association who were employees of the company, based on present existing conditions. The decision rendered was not based on existing conditions, but on a letter written by J. F. Barnes, former general manager, which was technically construed as continuing the 60-cent per hour rate of wage. As a matter of fact, the conditions of the letter were never carried out in that the Public Service Commission refused to grant the company all of the increases sought for and referred to in the letter, and such increases as were granted were not authorized until sixty days after the time contemplated by the parties and in no event was the 60-cent rate intended to extend beyond May 31, 1921.

Under existing conditions the high rate of 60 cents an hour is entirely out of proportion to the wages paid for similar service throughout the State generally and is ruinous to the company financially. It cannot render present service under such an unreasonable rate of wage and in order to lessen the loss of this company, it will necessitate the immediate installation of one-man cars on all city lines. And even with the installation of one-man cars this company will be unable to pay war-time wages in times of peace without incurring great loss.

Electrification Urged

Residents of the surburban cities on the peninsula adjoining San Francisco recently presented a petition to the Southern Pacific Company asking the company to electrify the double-track steam line between San José and San Francisco on which interurban traffic is handled. All of the suburban cities between San Francisco and Palo Alto, a distance of 30 miles, are served by an excellent concrete highway which leads directly into San Francisco. In addition to a bus system and the steam railroad, which operates a commuters' schedule during the rush hours, there is also an interurban electric line that runs as far as San Mateo, 18 miles down the peninsula from San Francisco.

Still, there is an insistent demand for an electrified interurban service on a private right-of-way where high speed will be safe and where long trains can accommodate crowds during the rush hours, while small light units could be economically operated at reasonably frequent intervals during the off-peak hours.

In a letter addressed to Daniel C. Imoden, executive secretary of the peninsula bureau of chambers of commerce and civic associations at San Meteo, Cal., William Sproule, president of the Southern Pacific Company, gives his views on this proposed electrification. He said in part:

High cost of money caused by the world war, excessive taxation, unequal competition by untaxed motor vehicles for hire over public highways which we were heavily taxed to build in the first place and are taxed to maintain afterward, with further competitive highway construction urged at this time, all combine of themselves to prevent the possibility of favorable answer to your call for electrification.

Paul Shoup, vice-president of the property, is also opposed to this electrification project on the ground that it would be an unprofitable undertaking.

In the absence of prospect for early electrification of the Southern Pacific steam lines, the Menlo Park Chamber of Commerce, stating that it was acting for all towns below San Mateo, adopted a resolution inviting the Western Pacific to extend its line northward into Santa Clara and San Mateo Counties. The president of this Chamber of Commerce, according to press reports, declares that plans are also being considered whereby the peninsula towns would build an electric line from Palo Alto to San Mateo so as to effect a connection there with the Market Street Railway.

Urges Relief from Paving Burdens

Jackson, Mich., has taken a forward step in recommending the abolition of the paving charges on the Michigan United Railways which operates in that city. A special committee, appointed by the City Commission of Jackson to investigate the affairs of the Michigan United Railways in that city, recommends that the company be relieved of the paving charge and also of the charge for sprinkling the streets it traverses, and furthermore the committee recommends that the company be given a 10-cent cash fare with five tickets for 35 cents and a 5-cent cash fare for children between the ages of five and twelve. This represents a substantial increase in the fares that have been charged in Jackson.

The report of this committee, which is constructive throughout, demanded that the company be maintained in a strong and secure financial position. It is attracting wide attention throughout the State of Michigan. The Michigan United Railways also operates in Lansing, Battle Creek and Kalamazoo and other Michigan cities as well as interurban cars between them.

In addition to these definite recommendations, this committee also recommends that

Much could be done by the patrons of the street railway if they would educate themselves to the thought of assisting to expedite the service and avoid unnecessary delay. Loading and unloading the car is delayed by patrons, unnecessary stops are demanded, care is not taken by the people in calling for the right streets and in many other ways delays are forced upon the service which by a little forethought could be avoided and much of the waste eliminated.

Franchise Draft Expected

Progress Being Made Toward Conducting Negotiations Which Will End Des Moines Struggle

With the return to Des Moines on Oct. 6 of M. H. McLean and F. C. Chambers, president and general manager, respectively, of the Des Moines City Railway, there are evidences that actual progress has been made in the negotiations looking toward the end of the Des Moines street railway muddle. It is understood that Mr. McLean is coming to Des Moines to participate in the entire negotiations with the City Council and in the franchise election. It is likely that final draft of the franchise will be handed to the Council not later than Oct. 7.

Mr. McLean and Mr. Chambers were in Chicago on Oct. 5 in conference with representatives of the McKinley interests, owners of the Des Moines Electric Company, relative to the clause in the proposed franchise which permits the railway to sell electric power. One Des Moines daily published a story on Oct. 4 that the subject covered at the conference was the sale of railway plant to the McKinley interests, but this is not taken seriously by the business people in Des Moines. No officials of the city railway could be reached to verify or deny the report.

J. G. Gamble, attorney for Des Moines City Railway, was quoted in the daily papers on Oct. 4 to the effect that service on the basis of sixty cars could be available very shortly after the franchise ordinance is passed by the Council.

One of the reasons for Mr. Chambers' visit to Chicago according to Mr. Gamble was to prepare means for financing the resumption of service in the event the franchise is passed by the Council.

The police department took a firm hand in bus operation this week and ordered that buses must submit to brake inspection once a week by a city mechanician; that buses must be equipped with doors on Oct. 5 and that buses must not be opened until the vehicle has come to complete stop. Buses are also ordered to come to a complete stop at railroad crossings and are prohibited from stopping at street intersections.

A canvass of 12,000 Des Moines women by the women's bureau of the Chamber of Commerce completed on Oct. 5 showed 99½ per cent favored the electric railway as against the buses; 94½ per cent voted for the 8-cent fare franchise, provided fares are reduced when traffic increases. The vote will be placed in the hands of the City Council on Oct. 7. Sentiment has steadily crystallized in favor of the railway during the past two weeks.

Buses Must Be Regulated

Toledo Commissioner Insists Improved Railway Service Will Not Eliminate Jitney

W. E. Cann, commissioner of street railways, Toledo, Ohio, for the first time since he assumed this position seven months ago, has made public comment on the service-at-cost franchise of the Community Traction Company as it is being operated in his city. The occasion of Mr. Cann's public remarks was furnished by a recent newspaper interview in which Mr. Bradley, president and general manager of the Walding, Kinnan & Marvin Company and a member of the commission appointed by Judge Killits to draft the service-at-cost ordinance, discussed bus competition and suggested improved electric railway service as the means of offsetting jitney competition.

Service-at-cost became effective in Toledo on Feb. 1. Mr. Cann has selected the month of January, the month previous to the adoption of the service-at-cost, and August, the last month of operation under the ordinance, as fitting months for a comparative study of service-at-cost operation. He says in part:

In the month of January, 1921, there were carried on the electric railway cars in Toledo 6,042,813 so-called revenue passengers. This figure includes the full fare passengers, children, purchased transfers and tickets or tokens and does not include free transfers or employees' tickets. In the month of August there were carried 4,608,393 revenue passengers, a decrease of 23.74 per cent. These figures graphically illustrate the decline in riding, and in this connection it might be well to remember that a material decrease in fare became effective on Feb. 1.

Contrary to the general idea the introduction of a cheaper rate of fare did not act as a stimulus to business, for our records show that during January, passenger travel was at the average rate of 194,284 passengers per day, while in February our records show a drop to an average rate of 151,455 per day.

Decrease in passenger travel, due entirely to the industrial situation, has been constant and uniform since the ordinance became effective. Such a marked decrease in travel would from a business standpoint warrant a decrease in car service.

It is, and has been, my aim to operate this property on a business basis yet there are certain factors and elements incident to electric railway operation which prevent a decrease in service in direct ratio to the decrease in passenger travel.

In January the Toledo Railways & Light Company operated 2,275 round trips per day. At the present time our schedule requirements call for 2,165 round trips per day, an actual decrease in service of 4.84 per cent, as compared with a decrease in the revenue passengers carried of 23.74 per cent.

In January the average speed of all cars operated in the city was 8.79 m.p.h. This speed has been gradually increased to 9.54 m.p.h., so that on the majority of lines the actual running time from the outer terminus to the center of the city has been reduced from two to four minutes. While the effect of reducing the service has in some instances slightly increased the gap between cars, the additional time spent waiting for a car is more than offset by the time saved due to the increased speed of the cars.

Mr. Cann defended the cuts in service as "reasonable, and good business practice," and said that it was not his desire to boom the bus nor to assist in any form of unfair competition but to give Toledo the best and cheapest transportation system in America.

In reply to Mr. Bradley's suggestion that good railway service would absolutely eliminate the bus because the bus would have no business in the streets where car lines served, Mr. Cann said:

This plan has already been tried out but until such time as buses are required to compete with street cars on a fair basis and are subject to the same rules and obligations as to service, routes, liability and taxes, they will continue to skim the cream of the transportation business, while the street cars must stand the brunt of furnishing continuous service during the periods of the day when travel is at a minimum and revenues fall far short of even meeting operating expenses.

"Distance Lends Enchantment"

Omaha is a long, long way from São Paulo, Brazil, but not so far as to keep Brazilians from admiring the type of electric car operated by the Omaha & Council Bluffs Street Railway, Omaha, Neb. It is reported that in looking over some magazines recently devoted to municipal undertakings some South American officials saw a picture of a car, No. 1001, used on the Farnam Street line in Omaha. No. 1001 is a type built by the local railway, seats forty-five passengers and costs $15 000.

Our Latin cousins were so favorably impressed with the picture of this car that they "up" and notified their agents, the Canadian Engineering Company, New York, to secure the plans of this vehicle. R. A. Leussler, vice-president of the railway, has sent the plans on to New York.

Industrial Publishing Added to Modern Curriculum

The New York Business Publishers Association announced on Sept. 23 the establishment of a course in industrial publishing. The course will include lectures, conferences, text books, problems, and a personal commenting service. Classes are now being organized in New York and will soon be organized in other publishing centers. The course can also be taken by correspondence.

Although the course is designed primarily for the benefit of members of the editorial and business staffs of trade and technical periodicals, it will be open to all who are interested in the field. It is intended not only to give instruction, but to develop the business as a whole by setting up higher standards of editorial and business service and showing how these standards can be attained. Among the topics covered are distinctive features of industrial publishing; its code of ethics; personal qualities required for success; determining editorial policies; getting the right kind of articles; securing accurate reports and data; writing for industrial papers; building up circulation; creating advertising; departmental management; service to the industry; service to advertisers; basic policies and tendencies. The editor of the fifteen text books to be used in this course is Henry H. Norris, managing editor of the ELECTRIC RAILWAY JOURNAL, who has received a leave of absence from this paper to undertake this work. Further information can be obtained from the secretary of the Course in Industrial Publishing, 185 Madison Avenue, New York.

Saginaw Rejects Municipal Bus Proposal

An effort by Commissioner Phoenix of Saginaw, Mich., to have necessary resolutions and an ordinance prepared by the city attorney looking to the establishment of a municipally-owned motor bus system received a setback at the hands of the Council on Sept. 27 when all members declined to support his motion to adopt a resolution authorizing the city attorney to proceed.

This and the statements of the commissioner that the jitney buses had failed to provide suitable transportation for Saginaw since the suspension of electric railway traffic nearly two months ago are the outstanding features in the efforts of the Council to provide an adequate means of carrying the people.

Since the road went into the hands of a receiver on petition of several of its creditors officials of the Saginaw-Bay City Railway have declined to make any statements as to when electric railway service might be expected to be resumed.

Sentiment seems to be gaining that the Council must do something to provide suitable transportation, and many are predicting that unless action is taken soon, jitneys will absolutely fail when winter comes. Even Commissioner Phoenix, friend of the jitney operator, has had a change of heart and publicly says, they are "dangerous" and cannot take care of the city's requirements. He has always leaned toward municipal ownership and asserts if the Council does not stand with him on the matter he will circulate petitions to the electors and force the adoption of municipal ownership.

It was Phoenix who proposed a jitney ordinance to regulate the buses, but after several conferences the measure has been forgotten. The buses are being run to suit the owners and people are riding at their own risk as none of the jitneys provide insurance in case of personal injuries.

Wages Cut Four Cents

A wage reduction of 4 cents an hour was made by the Los Angeles (Cal.) Railway on Oct. 1. A raise of 5 cents an hour was placed in effect in August, 1920, to meet the increased cost of living at that time. According to the railway's statement:

The management realized that the men needed temporary financial relief and determined that the company should lose rather than its employees should suffer. The increase in wages has resulted in a great loss, which it can stand no longer. The cost of living has decreased somewhat and it will fall further. The condition is general throughout the country.

The new scale in cents per hour is as follows:

First three months	46
Next nine months	47
Second year	48
Thereafter	50

Safety car operators on shuttle lines will receive 2 cents an hour additional and on line cars will receive 4 cents an hour additional.

The Pacific Electric Railway has put into effect a similar cut.

Relief Suggested for Present Unemployment

President's Conference Confident Existing Situation Will Be Improved by Recognition of Principles It Has Laid Down and Compliance With Its Recommendations—Readjustment of Prices Essential to Promote Renewed Buying

TWELVE recommendations have been adopted by the President's Unemployment Conference for emergency relief in the present crisis. These recommendations lay down a standard procedure, urge in detail the resumption of certain classes of work and propose measures of relief applicable to manufacturing establishments.

The conference completed on Sept. 30 the first part of its work, the consideration of measures for emergency relief of unemployment, and then adjourned to meet again Oct. 10 in order to consider measures for preventing or mitigating unemployment periods in the future.

Organization of the conference was effected on Sept. 26 and the work divided among committees on statistics, employment agencies, emergency measures in public works, in manufacturing, in transportation, in construction, in mining and in shipping. These committees immediately got to work, and though it was not expected that they would be ready to report until Oct. 5, such progress was made that they presented their findings to the conference as a whole on Sept. 30 and adopted recommendations with reference to emergency measures. These recommendations follow in part:

METHODS OF PROCEDURE

1. The conference finds that there are, variously estimated, from 3,500,000 to 5,500,000 unemployed. There has been an improvement, but pending general trade revival this crisis in unemployment cannot be met without definite and positive organization of the country.

2. The obligation of meeting the emergency of unemployment is primarily a community problem. The responsibility for leadership is with the Mayor and should be immediately assumed by him.

3. The basis of organization should be an emergency committee representing the various elements in the community. This committee should develop and carry through a community plan for meeting the emergency, using existing agencies and local groups as far as practicable. One immediate step should be to co-ordinate and establish efficient public employment agencies and to register all those desiring work It should co-ordinate the work of the various charitable institutions. Registration for relief should be entirely separate from that for employment.

4. The personnel of the employment agencies should be selected with consideration to fitness only and should be directed to find the right job for the right man and should actively canvass and organize the community for opportunities for employment. The registry for employment should be surrounded with safeguards and should give priority in employment to residents. Employers should give preference to the emergency employment agencies.

5. The emergency committee should regularly publish the numbers dependent upon them for employment and relief that the community may be appraised of its responsibility. Begging and unco-ordinated solicitation of funds should be prevented.

CLASSES OF WORK URGED

6. Private houses, hotels, offices, etc., can contribute to the situation by doing their repairs, cleaning, and alterations during the winter instead of waiting until spring, when employment will be more plentiful.

7. Public construction is better than relief. The municipalities should expand their school, street, sewage, repair work and public buildings to the fullest possible volume compatible with the existing circumstances. Municipalities should give short time employment the same as other employers.

8. The Governor should unite all state agencies for support of the Mayors and, as the superior officer, should insist upon the responsibility of city officials; should do everything compatible with circumstances in expedition of construction of roads, state buildings, etc.

9. The federal authorities, including the Federal Reserve Banks, should expedite the construction of public buildings and public works covered by existing appropriations.

10. A congressional appropriation for roads, together with state appropriations amounting to many tens of millions of dollars already made in expectation of and dependence on federal aid, would make available a large amount of employment. Notwithstanding the necessity for economy, the conference under existing circumstances recommends congressional action at the present session in order that work may go forward.

11. The greatest area for immediate relief of unemployment is in the construction industry, which has been artificially restricted during and since the war. We are short more than a million homes; all kinds of building and construction are far behind national necessity. We recommend that the Governors summon representative committees, with the co-operation of the Mayors or otherwise as they may determine, to (a) ascertain facts; (b) to organize community action in securing adjustments in cost, including removal of freight discriminations, and clean-out campaigns against combinations, restrictions of effort and unsound practices where they exist, to the end that building may be fully resumed.

12. Manufacturers can contribute to relieve the present acute unemployment situation by:

(a) Part time work, through reduced time or rotation of jobs.

(b) As far as possible, manufacturing for stock.

(c) Taking advantage of the present opportunity to do as much plant construction, repairs and cleaning up as is possible, with the consequent transfer of many employees to other than their regular work.

(d) Reduction of the number of hours of labor per day.

(e) The reduction of the work week to a lower number of days during the present period of industrial depression.

Employees and employers are urged to co-operate in putting these recommendations into effect.

A large number of employers have already, in whole or in part, inaugurated the recommendations herein set forth, and for this they are to be commended, and it is earnestly urged upon those employers who have not done so to put same into use, wherever practicable, at the earliest possible opportunity.

12. Specific methods for solution of our economic problems will be effective only in so far as they are applied in a spirit of patriotic patience on the part of all our people.

During the period of drastic economic readjustment through which we are now passing the continued efforts of any one to profit beyond the requirements of safe business practice or economic consistency should be condemned. One of the important obstacles to a resumption of normal business activity will be removed as prices reach replacement values in terms of efficient producing and distributing cost plus reasonable profit.

We, therefore, strongly urge all manufacturers and wholesalers who may not yet have adopted this policy to do so, but it is essential to the success of these measures when put into effect that retail prices shall promptly and fairly reflect the price adjustment of the producer, manufacturer, and the wholesaler.

When these principles have been recognized and the recommendations complied with, we are confident that the public will increase their purchases, thereby increasing the operations of the mills, factories and transportation companies, and consequently reducing the number of those out of employment.

Commission Procedure Outlined in New York

Public Hearings Next Step in Considering Transit Board's Recommendations—Politicians See Sinister Influence at Work

As was made plain in the last issue of the ELECTRIC RAILWAY JOURNAL the plan advanced by the New York Transit Commission for a settlement of the traction problem in that city is only a preliminary outline. The commission has taken the attitude of not commenting on the matter for publication, but the members have met the daily newspaper men to answer informally such questions as might be asked. It is understood, however, that when all the criticisms and objections, both constructive and obstructive, have been filed they will be met by a statement from the commission.

AS THE next step in furtherance of the adoption of the plan it is proposed to institute a series of public inquiries, the first of which will be set for an early date, at which the several companies will be subjected to further examination as to their affairs and in particular as to their attitude toward the plan. At these hearings an opportunity will be afforded for criticism and constructive suggestion. In conducting these inquiries, the commission, under the law, will have all the power of a committee of the legislature.

VALUATION WORK BEING CONCLUDED

Until these public examinations have been held and until the work of valuation has been finished, the commission will not undertake to present in complete form what might be called the statutory plan. As for the valuation itself that work is rapidly being completed. Under it valuations according to existing security issues and present capitalization will be disregarded and the entire financial structure of the consolidated company will be based upon a new valuation.

The statement was made beyond peradventure by the commission that it would require that the rate of fare for the first year following the initiation of the plan should remain at 5 cents. The commission has further concluded that until there has been ample demonstration of the general results of the new plan and until the changes and economies the plan has in view are tested fully, there shall be no change in the present rate of fare.

POLITICIANS QUICK TO REPLY

This would seem to be too plain to be successfully controverted. To Mayor Hylan, however, the unmistakable intent of the commission as so expressed apparently means nothing. He sees in it all a deep laid plot. According to him the real plan will be disclosed after election. Its character, so the Mayor says, will depend "according to whether or not a Board of Estimate is elected for the city that will adhere to the policies of the present administration in preserving the public rights with respect to traction contracts and the inviolability of the 5-cent fare, or whether a complacent set of men is elected with aid of the delusive bait in this 'preliminary plan' to do as the traction interests bid." It is "gratifying" to the Mayor to find in the plan a provision for the use of buses to supplement the traction lines.

It was not until Tuesday that the comment of the Mayor appeared. His associates in political office, however, were less prone to delay. Those who took it upon themselves to comment upon the report before a day had elapsed after its presentation were Comptroller Charles L. Craig, Commissioner of Accounts Hirschfield, Corporation Counsel O'Brien and the presidents of the Boroughs of Brooklyn, Queens, the Bronx and Richmond. While the characterizations of the report by these gentlemen varied in particulars they all professed to see in the commission's statement malign influences at work. Mr. O'Brien referred to the report as a "concededly incomplete and camouflaged pronouncement."

To the newspaper men the railway officials with one exception asked for time in which to consider the commission's statement carefully. The exception was H. Hobart Porter, vice-president and general manager of the Brooklyn City Railroad. "From first reading," said Mr. Porter, "I felt that the commission had made a very comprehensive study of the situation and had prepared and submitted a plan which if the details for its execution could be acceptably worked out might prove a final solution for the transit situation here."

NEWSPAPERS SYMPATHETIC

With the exception of the Hearst papers both the afternoon and the evening newspapers are a unit in declaring in substance that back of the plan may lie the means for straightening out the affairs of the companies and bringing to an end conditions which have resulted in receiverships and the disintegration of the various systems, with the concomitant advances in fares in many instances and the lessening in nearly all cases of the value of the companies to the public in the service which they furnish.

Wage Arbitrators Drafting Decision

The arbitration committee in the wage controversy on the Connecticut Company's lines met at New Haven during the week ended Oct. 1 and after discussing the evidence submitted by both sides at recent hearings adjourned without reaching any definite conclusion.

It was agreed that Justice Beach, the third or "neutral" arbitrator, would present his ideas for review at a future meeting of the committee. The two other arbitrators will then suggest changes or alterations which will be gone over and discussed and an outline for a final decision arrived at if possible.

Joseph F. Berry, Hartford, the Connecticut Company's representative on the committee said:

> At a future meeting we will take up this draft for consideration. It might be adopted just as he draws it, or one of the others of us might have changes or alterations to offer. It is unlikely that Justice Beach's proposals will be made public before they have been taken up by the full committee.

City Council Will Consider New Franchise

With the hope and intention of making extended improvements and betterments to its system the Dubuque (Ia.) Electric Company, through its vice-president and general manager, has requested the City Council to call for a special vote of the people on a new twenty-five-year railway franchise.

Mr. Maynard, vice-president of the property, in a recent letter to the City Council reviews the after-war financial distress which has prevented his company expending any funds on additions, the dawn of prosperity which is about to break and his anxiety for Dubuque to be prepared to meet the changed conditions in order to supply the increasing need for transportation facilities. Production means must therefore be increased at once for new installations will require a great deal of money, time and labor.

In discussing the need for capital Mr. Maynard stressed the point that it was impossible to market a bond which outruns the present franchise and pointed out the limited market that exists for a short-term bond and the burdensome terms such financing would entail. With a guarantee of continued service in the city limited to five years and some months under the present franchise the financial difficulties attendant upon any new financing would appear insurmountable. But with a guarantee to the investors of a twenty-five-year grant improvements could be readily financed.

In its proposed franchise draft submitted by the company it does not fix the rates of fare to be charged, but leaves the matter of fixing just and reasonable rates to the City Council. Provision is also made for conducting negotiations for the purchase of the property by the city.

The new franchise would be effective following the passage of the ordinance by the City Council and the subsequent adoption by the people of Dubuque.

According to the Dubuque *Journal* the proposition deserves the serious and careful consideration of all voters. In a recent comment this paper says that if the granting of a new franchise would give Dubuque something better than it now has it would appear to be a wise step.

Purchase Price Fixed

$2,297,277 Fixed as Sum Detroit Shall Pay for "Day-to-Day" Detroit United Railway Lines

According to a report of the board of arbitration which was chosen to determine the price the city of Detroit will have to pay the Detroit United Railway for the 29½ miles of day-to-day lines, the price set for the lines and equipment is $2,297,277. This includes $1,605,000 for the trackage and $692,277 for 105 double-truck cars and 25 trailers and other miscellaneous equipment. The decision of the board was unanimous. The arbitrators were Prof. Henry E. Riggs, representing the railway, William H. Maybury representing the city and W. E. Davis, Cleveland, chosen by Messrs Riggs and Maybury.

LINES BUILT RECENTLY

The lines covered by the decision of the arbitrators were built by the company under day-to-day agreements which gave the city the right to purchase the lines whenever it was ready to operate them, the price to be paid to be based upon costs less depreciation. They include the Twelfth Street, Grand Belt and Hamilton lines, some of the company's later construction built between 1912 and 1920. With the trackage are included all necessary sidetracks, turnouts, curves, switches, spurs, connections, wires, poles, overhead power equipment, special work, crossings and equipment constructed under Council resolutions or contracts together with equipment necessarily furnished and acquired by the company for the operation of its cars over these tracks. The acquisition of these lines by the city was authorized at the election last April and they will be paid for out of the $15,000,000 municipal street railway bond issue authorized in April, 1920.

With approximately 60 miles of municipal lines constructed, the acquisition of the day-to-day lines will add approximately 50 per cent to the extent of the municipally owned system.

WORKING AGREEMENT SUGGESTED

In their report the arbitrators cite that in so far as it is possible to guarantee the protection of both parties it is desired to do so, and they recommend that the operating officials of both parties meet and draw up an agreement which will fully cover and protect certain points which developed during the hearing, and similar cases which may arise later. These points include the granting of running rights to each party over the other's tracks after the lines are taken over, to preserve the continuity of the existing lines. The arbitrators report that while there is nothing in the day-to-day agreements that specifically grants any authority to the arbitrators in this matter, they feel they would be remiss in their duties if they failed to direct attention to the fact that at four points at least, and undoubtedly at others as well there are and will be openings left for serious contention and considerable annoyance to the patrons of both sides.

This is termed an operating matter which must be cured by an agreement between the parties so as to secure harmonious co-operation between the two transportation systems of the city for the benefit of the riding public. The arbitrators further recommend that if it develops that the parties can not agree on the terms of such a contract the matter be referred to a disinterested board of arbitration in lieu of resorting to litigation.

In advising the city to take over the lines and equipment at once or to make provision for taking care of the cars, the arbitrators cited that in the event that there should be a delay in the taking over of this property by the city, there is a moral reponsibility on the Detroit United Railway to see to it that this equipment is fully maintained and that these particular cars are given fully as much or more care in the matter of running repairs and general upkeep as is given to the other new and modern equipment of the company. While the same comment is applicable to all property, it is believed to be particularly necessary regarding this equipment as neglect for a period of a few months would inevitably result in serious depreciation and might put the city to materially heavier costs of repairing than would be the case were the cars taken over now.

The board of arbitrators held its first hearing on July 19 and the last formal hearing was on Sept. 12. In all, twelve days were consumed in taking testimony. Over twenty witnesses were examined and a large amount of evidence and many data in the form of exhibits, reports and maps were studied.

It is anticipated that the lines acquired from the Detroit United Railway will be operated as part of the municipal street railway system as soon as the Street Railway Commissioners have completed the necessary transfers, and as soon as the street railway department has installed special track work connecting the lines with the municipal railway lines already built. This work of connecting the two systems can be commenced immediately by the city department.

Houston Decides Against Franchise

The proposed new franchise for the Houston (Tex.) Electric Company, a Stone & Webster property, which includes the electric railway lines and the lighting privileges in Houston, was defeated in a decisive vote at the special election on Oct. 4. The vote was the lightest total vote polled in a city election in recent years. Only four small city wards favored the franchise, one was tied and the others decidedly against.

Mayor Holcombe said after the election that the City Council would at once begin the work of drafting a traction franchise that would be approved by the citizens. He said further that railway service in Houston must be improved and that this would be the main consideration in the drafting of the new franchise.

Denounces City Scheme

Justice James C. Cropsey, in the Supreme Court, Brooklyn, N. Y., denied the application by the city to start condemnation proceedings against three streets in Queens on the grounds that the city was actually attempting to get possession of the lines of the North Shore Traction Company and operate the cars.

The city claimed that the three streets were needed to complete boulevards. The Judge decided the city had no authority to go into the business of operating street cars and that if some property were desired by the city which did not belong to the North Shore Traction Company such an application might be granted.

$1,000,000 Expenditure Suggested to San Francisco Municipal Railway

An entirely erroneous impression has been caused by accounts telegraphed to the papers in the east from San Francisco referring to the probable expenditure of $8,101,000 by the city of San Francisco, Cal., in extending its municipal railway system. It is said that this expenditure was recommended to the Board of Supervisors in a report by M. M. O'Shaughnessy, city engineer. A telegram to the ELECTRIC RAILWAY JOURNAL on Oct. 5 from its Pacific Coast editor resident at San Francisco says that the $8,000,000 figure is erroneous. It resulted from the reporters summarizing the cost of alternative routes. Even if all the proposed lines were built the total cost, excluding tunnel assessments, would be only about $1,000,000. In the following all mileages are double track. Four new lines under consideration include:

1.57 mile extension on Masonic Avenue	$225,000
0.88 mile line on Traval Street	120,000
0.91 mile line in Ocean View District	175,000

The Sunset district line would extend from the Ocean Beach along Judah Street connecting via tunnel with the present municipal lines for a direct route to the ferry. Estimates on four alternative tunnel routes for this line ranged from a total cost of $914,000 to $2,467,000. Of these totals the municipal railway funds would be needed only for track construction and an assessment district would be formed to cover the tunnel cost. Of these Sunset line alternatives Mr. O'Shaughnessy favors the 4.54-mile route using a 4,200-ft. tunnel on Duboce Avenue with track cost of $576,000 and tunnel cost of $1,900,000. Mr. O'Shaughnessy has reminded the board that these new lines will require $800,000 additional for equipment and carhouse. These estimates were made by Mr. O'Shaughnessy on request of the board.

Financial and Corporate

P. R. T. Net for Eight Months, $936,583

The total operating revenue of the Philadelphia (Pa.) Rapid Transit Company for the eight months ended Aug. 31, 1921, was $28,170,950. Of this amount $27,555,073 was passenger revenue. After deducting fixed charges amounting to $6,552,816 the net income for the period amounts to $936,583 against a deficit of $151,779 for the same period a year ago. The accumulated deficit for the twenty-month period to Aug. 31 now stands at $1,181,351.

The largest amount in passenger revenue for the first seven months of this year was realized in May when $3,686,931 was collected from 74,455,275 passengers. The month of February was lowest in traffic with a total of 63,033,838 passengers carried amounting to $3,140,820.

The total number of passengers carried from January through August inclusive was 555,773,826 against 605,581,130, a decrease of 49,807,304 over the same period a year ago. While the traffic handled decreased, the passenger revenue increased $3,322,937 over the first seven months of 1920.

Another Effort to Restore Shore Line Railway

It is reported that another effort is being made to restore the Shore Line Electric Railway between New Haven and New London. The latest proposal to this end comes from a Delaware corporation known as the Finance & Reorganization Company, New York. It outlines the plans as follows:

Subscription blanks for the new company set the amount of money to be raised at "not to exceed $4,000,000 of 7 per cent first mortgage gold bonds" and "common stock of the par value of $100 each, an issue not to exceed 7,000 shares."

Stocks and bonds are to be of a corporation to be known as the Shore Line Traction Company, a Connecticut corporation. In the subscription blank it says "In consideration thereof, the said Finance & Reorganization Company agrees to assign and transfer to the Shore Line Traction Company the part of the trolley line formerly belonging to the Shore Line Electric Railway between New Haven and Chester, in operating condition, with a power house and transmission line for said company for an amount not to exceed $900 000 in 7 per cent first mortgage bonds and 7,000 shares of common stock of the said Shore Line Traction Company."

Under the plan it seems apparent that the Finance & Reorganization Company would control all the securities of the Shore Line Traction Company with the exception of $100,000 of its bonds.

The subscription blank says that in the event that the company shall not succeed in selling $205,000 in bonds and $205,000 par value of stock any amount which shall have been paid shall be refunded.

When the company has sold bonds in the amount of $205,000 it will make demand for the payment at the purchase price or any part remaining unpaid to be used in the purchase of the property of the Shore Line Electric Railway.

Accumulated Dividends Financed

Financial Structure of Portland Company Rearranged to Suit Changed Conditions

Plans have been perfected for readjusting the capitalization of the Portland Railway, Light & Power Company, Portland, Ore., to bring it more nearly in line with the present requirements of the company. Hard hit by the industrial depression following the declaration of war in 1914, all dividends on the stock of the company were suspended. Progress of the company since then has been steadily forward with the result that it was recently felt that the financial structure of the company should be changed in the interest of the security holders deprived of their incomes, particularly as the earnings now justify the payment of first preferred dividends.

While the credit of the company to profit and loss amounts to more than the total of the accumulated dividends, the cash has been expended on improvements and for the payment of sinking funds and it was therefore desirable that the accumulated dividends should be paid in some other way than in cash. As a matter of fact the value of the stock equity in the property was increased by $6,625,000 while the stockholders were receiving no return.

The plan hit upon was to declare a dividend of 27 per cent on the first preferred stock, payable 2 per cent in cash and 25 per cent in first preferred stock at par. The stock issued in payment of this dividend will be cumulative from Oct. 1, 1921. In anticipation of this move the stockholders approved the plan for the change in the financial structure of the company, including the authorization of $10,000,000 of prior preference stock and increased the first preferred stock by $2,500,000. The capitalization of the company, following the consummation of the new plan, will be as follows:

	Authorized	Outstanding
Cumulative prior preference stock	$10,000,000	———
Cumulative 6% first preferred stock..	7,500,000	$5,000,000
Non-cumu ative 6% second preferred stock	5,000,000	5,000,000
Common stock....	20,000,000	11 250,000

The stock outstanding prior to the consummation of the present plan was as follows:

6% Cumulative first preferred stock	$5,000,000
6% Non-cumulative second preferred stock	5,000,000
Common stock, 75% paid ($11,250,000) and liable to calls up to 25%	15,000,000

The $15,000,000 of common stock outstanding has been over 75 per cent paid. This part paid stock will be retired and full paid stock issued to the amount paid in. The stockholder will then be released from all liability for the 25 per cent unpaid upon the part-paid stock. This requires the issuance of only $11,250,000 of full paid common stock.

The first preferred 6 per cent stock outstanding was issued $2,500,000 on Jan. 1, 1916, and $2,500,000 on April 1, 1917. There had accumulated on the $2,500,000 first issued 7½ per cent up to April 1, 1917, and this was paid in cash on July 1, 1921, thus making the entire amount of $5,000,000 of 6 per cent first preferred stock alike in the accumulation of dividends from April 1, 1917, which up to July 1, 1921, amounted to $1,275,000.

The $10,000,000 of 7 per cent prior preferred stock will probably be issued in series. The right is reserved to the stockholders to change the dividend rate and the redemption features. President Franklin T. Griffith of the company explains that the issue of the new stock was authorized to give the people of Oregon an opportunity to invest their savings in an Oregon enterprise. According to Mr. Griffith the company "will market it from time to time, as we need money, or as our friends are willing to buy. The money will all be used for the betterment of the property."

The company is out of debt except for funded and current obligations.

Splendid Return in July in Dallas

The Dallas (Tex.) Railway's report covering operation in July shows a considerable falling off in the number of passengers carried as compared with the number carried in June. Revenue passengers carried during June numbered 4,251,054, while for July the number was 4,097,755, a decrease of 153,299. Figures for July, 1920, show that a total of 4,298,150 persons were carried during that month.

Despite the falling off in the number of revenue passengers carried, the company broke all past records in amount and rate of returns. While the rate of return on the agreed valuation authorized by the franchise is 7 per cent, the return for July amounted to 8.67 per cent.

The return for July permits the setting aside of $13,146 for reserves, the largest amount set aside in any one month in the history of the company. Total gross receipts were $264,639, while operating expenses amounted to $196,470. This return was made before the recently announced 10 per cent reduction in wages of all employees became effective. The service maintained in July showed practically no change in car-miles operated.

$59,678 Loss in Eight Months in East St. Louis

The East St. Louis & Suburban Railway East St. Louis, Ill., is informing the public of its difficulties through the columns of local newspapers. In a recent statement President W. H. Sawyer shows that the company in the eight months ended Aug. 31, last, was short $59,678 of earning the revenue to which it is entitled under the valuation and interest charges granted by the Illinois Public Service Commission.

In this period there was a decrease of 20.05 per cent in the number of passengers carried as compared with the corresponding period of 1920. "But it seems that we reached bottom in August," says Mr. Sawyer, "for there was an increase in August over July." He predicts that the next three months will show a gradual increase in travel. In the meantime service has been cut slightly, though passengers are being handled as heretofore, and the public is informed of the conditions.

Montreal Has an Accumulated Deficit of $1,967,834

The Montreal (Que.) Tramways reports record gross earnings of $11,773,004 for the fiscal year ended June 30 compared with $10,782,470 for the preceding year. The balance after operating expenses and taxes and maintenance and renewals was $2,868,667 compared with $2,695,394 a year ago. Allowances due the company on this balance by the Tramways Commission based on the franchise was $2,489,959 compared with $2,452,269 in the preceding year. The balance of $378,707 was not sufficient to meet the city's rental allowance and required contingent reserve totaling $617,730 by $239,022, this deficit comparing with $364,700 a year ago. The accumulated deficit on that account since the going into effect of the new franchise in February, 1918, is $1,967,834.

Revenues Exceed Current Expenditures of $65,506

During the receivership for the Ohio Electric Railway, Springfield, Ohio, between Jan. 26 and July 14 the excess of revenue over current expenditures was $65,506. The income was $2,725,046 during the period. These facts were noted in the receiver's report made to Federal Judge John M. Killits at Toledo by B. J. Jones, Columbus.

In the disbursements the items for which the largest sums went were: Payroll, $944,640; materials, $286,722; fuel, $215,501; injuries and damages, $5,018; taxes, $39,487.

The last two weeks of the period showed disbursements of $197,877; of which $77,375 went to pay help.

The receiver's account of J. H. McClure in the case of the Indiana Columbus & Eastern Traction Company from July 15 to 31, showed receipts of $137.321, of which $33,499 was on hand at the beginning of the period, and disbursements of $105,871.

The lines accounted for in the bills of the Ohio Electric included the Columbus, Newark & Zanesville Electric Railway, the Indiana, Columbus & Eastern Traction Company, and the Fort Wayne, Van Wert & Lima Traction Company.

Fewer Passengers Carried in August

The report of the Seattle (Wash.) Municipal Street Railway, for the month of August showed that while the car riders paid about 33⅓ per cent higher fare than in August, 1920, the receipts were only 4.2 per cent higher, and that 2,025,911 fewer passengers rode. The passenger decrease was 20.3 per cent. The report, which was prepared by Superintendent of Public Utilities Carl H. Reeves, showed receipts for August, 1921, of $524,743 as compared with $503,599 for August of last year.

In August, 1920, 9,964,100 passengers were carried, while in August of this year, only 7,938,189 passengers rode on the municipal lines. The car-miles and car-hours of operation also went down, as evidenced by figures showing 1,328,438 car-miles in August of last year compared with 1,311,086 car-miles in August this year. In August, 1920, $400,656 was expended in operation and in August of this year $367,070.

Valuation of Traction Properties Fixed

The Oklahoma State Board of Equalization has fixed valuation for purposes of taxation on Oklahoma traction and interurban lines as follows: Oklahoma Gas & Electric Company, $4,254,831; Muskogee Gas & Electric Company, $1,395,063; Enid Railway, $75,000; Chickasha Railway, $25,000; Guthrie Railway, $25,000; Lawton Railway, $59,000; Muskogee Traction Company, $335,000; Oklahoma Union Railway, Tulsa, $350,000; Okmulgee Northern Railway, $207,000; Oklahoma Railway, Oklahoma City, $3,118,586; Pittsburg County Railway, McAlester, $400,000; Sapulpa Interurban Company, $50,000; Shawnee-Tecumseh Traction Company, $55,000; Tulsa Street Railway, $300,000.

Interurban Rental Advanced

By a recent order of the Michigan Untilities Commission an advance of practically 100 per cent has been allowed in rental charges to be paid by the Grand Rapids, Grand Haven & Muskegon Interurban Railway to the Muskegon Traction & Lighting Company for use of the latter's tracks in the city of Muskegon, Mich.

Under the new ruling the interurban must pay annually $4,000 for use of tracks, two-fifths of local fares, 2 cents for every through passenger and 10 cents per freight-car mile for all freight moved over city tracks. The old contract called for a rental of $2,000 with a 1-cent charge for every passenger.

$288,850 Taken by Jitneys from Municipal Railway

Figures prepared by the Department of Public Utilities of the City of Seattle show that the jitney service during the year 1920 deprived the Seattle Municipal Railway of approximately $288,850 in revenues, derived from carrying 3,610,724 passengers. The above estimate is based on an average fare of 8 cents, taking into consideration the fact that car riders pay 8⅓ cents for tokens, a 10-cent cash fare and also use transfers.

Toledo August Deficit Only $20,098

The report made by Street Railway Commissioner Cann of Toledo, Ohio, shows that the August deficit of the Community Traction Company was only $20,098. This is less than half the July deficit. In January, before the Community Traction Company took over the lines, the number of passengers carried at a 7-cent fare and 2-cent transfer was 6,042,000. At no time since has the fare been that high and yet in August the total number of passengers carried was 4,608,393.

Mr. Cann believes that the industrial slump is almost entirely to blame for the showing. He points out that so far September figures show that the tide has turned. Checks have shown that the bus business has also decreased considerably.

The financial report shows that the Community Traction Company has cash in various funds set up amounting to $267,905, including $51,032 in the sinking fund, which represents city ownership in the system. However, in other funds there is a combined deficit of $377,074, the greater part of which is in the stabilizing fund.

The increase of gross revenue during August was $21,233. A part of this represented one-fifth of the rebate due on power since the new contract with the Toledo Railways & Light Company was signed.

Toledo Bonds Offered

The Toledo Traction, Light & Power Company, Toledo, Ohio, is offering $2,500,000 first lien 7 per cent gold bonds for subscription through a syndicate.

The company owns 93 per cent of the common stock of the new Toledo Edison Company, the successor to the Toledo Railways & Light Company, and also controls all of the $1,500,000 of preference stock of the company.

This offering is a part of the comprehensive plan of financing all of the electric power, lighting, gas, heating and railway property of Toledo. The holding company has pledged a large portion of the 6 per cent bonds of the Community Traction Company as security for the present issue of bonds.

A loan of $12,000,000 will be retired through the new financing. This will release the railroad property directly from all obligation except the bonds of the Community Traction Company.

Traffic and Transportation

No Fare Referendum in Cincinnati

A referendum on the recently enacted ordinance reducing fares on the lines of the Cincinnati (Ohio) Traction Company will not be held at the November election if the report filed with the Ohio Supreme Court at Columbus is approved by that body. The report was filed by Hugh L. Nichols, former Chief Justice of the Supreme Court of the State of Ohio, who was appointed to hear the testimony in the city of Cincinnati's protest against the referendum. It shows that a total of 5,312 signatures appearing on the referendum petitions circulated by the Citizens' Committee have been withdrawn or stricken off by order of Judge Nichols.

The petitions originally contained 14,574 signatures and after the above number had been deducted the petitions lack sixty-two signatures of the number necessary to warrant a referendum. The report of Judge Nichols if sustained by the Ohio Supreme Court will knock out the referendum petitions against the ordinance and franchise amendment which have reduced fares since Aug. 1. The ordinance and franchise amendment under which the Cincinnati Traction Company is operating also provides that fares shall be reduced another half cent to 7½ cents on Nov. 1.

The Ohio Supreme Court has since refused the writ of mandamus filed by the Citizens' Committee seeking to compel the city auditor to certify petitions for a referendum to the Board of Elections. The decision of the court gives the city a victory on the fare question. The ruling was made after the report of Judge Hugh Nichols, who sat as umpire, had been presented.

The ordinance in question was passed by the City Council last June, and provided that if the city conceded deferment of the payment of the franchise tax by the traction company until next year a reduction of one-half cent in fares would become effective on Aug. 1 and a further reduction would be made on Nov. 1 to 7½ cents. In addition the company would be compelled to grant the reduced rate to children attending public, parochial and high schools.

The extension of the time granted for the payment of the franchise tax was deemed to be merely technical since under the terms of the franchise the tax is to be paid only when it is earned, but deferred payments become cumulative. The traction company did not earn the tax last year, nor for the period this year preceding the passage of the ordinance.

As stated previously the fraudulent signatures together with those withdrawn by request reduced the number to less than legal requirement. Thereupon the Citizens' Committee attempted to file petitions containing 700 additional signatures, but the city auditor refused to accept them upon the ground that the time allowed by law in which to file the petitions had lapsed and he had no legal right to include the additional names. The Citizens' Committee then filed the mandamus suit in Supreme Court. Former Chief Justice Hugh Nichols was named Master Commissioner to hear testimony and file his conclusion regarding the facts with the court.

Unlimited-Ride Weekly Pass Started at Youngstown

The Youngstown (Ohio) Municipal Railway placed in operation, beginning Monday, Oct. 3, a weekly unlimited-ride, transferable pass similar to that in use at Racine, Wis., for the past two years and adopted for Kenosha in January, 1921. The price of the pass is $1.25 as against a cash fare of 9 cents and a ticket fare of 8⅓ cents (six for 50 cents). One advantage expected from the pass is the capture of riders using the 10-cent jitneys. The jitneys are almost entirely of touring-car type, the jitney bus being unable to compete with the smaller and swifter pirate.

Preceding the introduction of the pass, cards printed on both sides (with the side showing fewer words but bigger type facing the auto-rider and the walker) were displayed in the cars and advertisements run in both the daily English and weekly non-English papers. News stories and interviews concerning the use of the pass were also arranged for. Calls were made on the leading department stores, all of which agreed to place passes on sale during the introductory period, several going so far as to give an "ear" or box-head to the pass in their own advertising copy.

The downtown theaters and cinemas were canvassed, and these agreed to accept and display slides referring to the pass. The co-operation of the Y. M. C. A. and Y. W. C. A. was also gladly given. All of these interests—stores, theaters and schools—realized the possibilities of the pass to them in its encouragement of off-peak riding. Talks were given to the car operators and before the Kiwanis Club. Preparations have already been made for follow-up publicity to be suitable to the weather and other conditions that cause changes in riding.

Passes are placed on sale the Friday of the week (Monday a.m. to Sunday midnight) preceding the use of the pass, and sales are continued up to Wednesday of the week in which the pass is valid. The sales for the first week (Oct. 3-Oct. 10) were reported as 4200.

Jail Sentence for Broomhead, Jitney Operator

The first jail sentence for lawless jitney operators in Albany, N. Y., since the United Traction Company began its fight against the jitneys was imposed on Oct. 4 by Justice Harold J. Hinman. Frank Broomhead, Cohoes, was the offender. He must serve thirty days in the Albany County jail on a charge of criminal contempt of court for the second time.

Broomhead had been served with the injunction restraining illegal competition with the United Traction, but continued operating his jitney between Cohoes and Troy. The temporary writ of injunction was made returnable before Justice Hinman on Sept. 10. Broomhead was one of the eleven men who were charged with contempt of court. He was accordingly fined $100 by the judge.

On proof that the jitney business was being carried on by Broomhead on Sept. 17 and 19 the United Traction went further in the proceeding. At a subsequent hearing Justice Hinman reviewed the testimony and declared that there were inconsistencies in Broomhead's defense and that no credence could be given to his statements. Justice Hinman's finding follows in part:

> The court recognized the state of mind which had been permitted to prevail among the so-called jitney operators that even though the Appellate Division had held their acts to be a crime the processes of the criminal law were inadequate to punish them and that somehow they were above the law. So they continued openly and flagrantly to violate the law and held it in almost perfect contempt until it became apparent that the lawless of this section of the State were being schooled to become more lawless, the thoughtless among us to lose what respect they may have had for law and order and the sober minded and far sighted to feel uneasy for the future when the law could be so flagrantly defied with impunity.
>
> It is the policy of the law to deal more gently with first offenses wherever possible, but the willful renewal of the offense cannot be tolerated. It must be dealt with sternly and the charge made here against the respondent, Broomhead, is that he has repeated the offense at least twice since receiving punishment and kindly admonition. If guilty, it is my duty to impose a more severe penalty this time as punishment to him and as a warning to others.

Fare Reductions Sought in Connecticut

Fare on electric railways will be considered by the Connecticut Public Utilities Commission at Hartford on Oct. 18 and 19. The first hearing will be held on a petition of the Common Council of New Britain and that of the city of Norwalk, both calling for reduced rates. The Common Council of Hartford has also taken up the matter of reduced fares, but it has been determined that the time is not yet opportune to ask for a general reduction. Factors which may enter prominently into the consideration of the fare matter at this time are the elimination of jitney competition by the State and the prospects for a reduction in the wages of the trainmen of the Connecticut Company in the arbitration proceedings recently brought to a close.

Syracuse Wants Fare Reduced

The city government of Syracuse, N. Y., will launch a new fight in November to reduce fares on the lines of the New York State Railways in Syracuse, Edmund H. Lewis, corporation counsel, has announced.

A demand will be made before the Public Service Commission that the 8-cent straight fare and the 7¼-cent ticket fare be reduced to 5 cents. Mr. Lewis believes the New York State Railways cannot substantiate the needs of the present alleged exorbitant fares in order to provide a fair return on the value of its property.

Milo R. Maltbie, public utilities expert, will be retained by the city to aid in fighting the case.

Mr. Lewis is quoted as follows:

> We are planning to go before the commission early in November and endeavor to force a reduction in fares. The old Public Service Commission, which passed out of office soon after it made the fare award in the Syracuse rate case, provided in its order that the city could not appeal to the commission again until six months had expired.
>
> We never have felt that the present rates were fair, and we do not believe the value of the property used by the company entitles it to present fares. Traffic will increase with the approach of bad weather and we believe we will be in a better position to get all the facts fairly before the commission than at present. The present purpose is to file the complaint against the present rates the moment the six months' period expires.

The Public Service Commission has agreed to send one of its experts here to observe actual conditions. That investigation is scheduled to start within a few days.

Jitney Issue Before U. S. Court

Corporation Counsel Walter F. Meier of Seattle has gone to Washington, D. C., to represent the city in its last legal battle for the right to oust jitneys from competition with the Seattle (Wash.) Municipal Railway. The action before the United States Supreme Court will be in the nature of an application for an appeal to the court from the decision of the Supreme Court of the State of Washington, which recently vacated the injunction in the McGlothern case under which the jitney interests in Seattle were protected.

Should the application be granted, the jitney owners would have the right to appeal to the State Supreme Court for a continuance of that injunction, upon posting a proper bond, until the case should be argued before Justice McKenna, who is assigned to this circuit on the Federal Supreme Bench. The jitney interests will be represented in Washington by Representative Merrill Moores of Indianapolis.

Recently the city utilities committee of Seattle refused to grant permission to twenty-seven members of the Auto Drivers' Union to operate jitneys in Cowen Park district. This section is strictly residential and was built almost entirely on the strength of jitney service, and its residents are prepared to fight the removal of jitney service from the district. Property owners are preparing to organize for a vigorous compaign against the decision.

Another example of the city's objection to jitney competition is found in its filing with the State Department of Public Works a protest against buses to Seahurst and Three Tree Point in competition with the Lake Burien line of Municipal Street Railway.

More Five-Cent-Fare Lines

In announcing the plan of the trustees of the Boston (Mass.) Elevated Railway to extend the 5-cent no-transfer plan to seven additional sections of the company's system, Chairman James F. Jackson strongly intimated the purpose of the trustees to reduce the 10-cent basic fare unit. In a statement he said:

> An experiment of short-distance, local riding without transfer privilege for cheap fare has already been inaugurated in several localities. The first of these lines was opened in March in Everett and Malden; the second in May in Medford and Somerville; the third in June in East Boston; the fourth in August in Charlestown, North Cambridge, Belmont, Waverly and Watertown; the fifth in September in Dorchester and Roxbury. Last Saturday certain lines of this character were established in West Roxbury and one line between Allston and Dudley street via Brookline Village.
>
> The development of similar service affecting South Boston, Somerville, Cambridge, Brighton, Roxbury, Jamaica Plain and Brookline is now under study.
>
> It has been said and should be repeated that this cheap service is and must remain for at least many months purely as an experiment. If a reasonable test of it proves that either singly or collectively this limited service invades or seriously threatens the net revenue of the railway it will become necessary either to advance the local fare or to abandon the experiment. It cannot be continued if it materially interferes with or delays any otherwise possible reduction of the basic flat fare for travel throughout the system. On the other hand if it can be maintained without any injustice to those who pay the basic 10-cent fare, it is of great importance in increasing the usefulness of the railway.

Seven Cents in Toronto

Fares at present in force on the lines of the Toronto (Ont.) Railway as operated by the city are as follows:

Cash fare	7 cents
Tickets, 4 for	25 cents
16 for	$1.00
Book of 50 for	$3.00

Children in arms and children 51 in. in height or less, 4 cents cash, or seven tickets for 25 cents.

Night car fares ..... 15 cents each

It will be recalled that during the concluding days before the city took over the Toronto Railway on Sept. 1 Mayor Church insisted upon a continuation of the 5-cent fare, but the commission stool pat for the increase in fares and won out, as of course the commission has been clothed with the necessary authority to "run" the system. The idea of the commission was to fix a rate that would make the system self-sustaining from the start.

The changes in the fares has resulted in a large number of people who live just a few blocks away from the old Toronto Railway lines and who formerly walked, after leaving the Toronto Railway cars, now making use of the former Civic Railway lines on Danforth, Gerrard, Bloor, etc., as of course the one 7-cent fare entitles them to a transfer.

Bus Petition Rejected

Commission Refuses Request of Ultimate Bus Company to Operate in West Virginia

The State Road Commission of West Virginia, recently rejected the petition of the Ultimate Bus Company to operate in the State of West Virginia. The company has been operating buses between Wheeling, Martins Ferry, Bridgeport and Bellaire.

Several weeks ago following differences with the Wheeling Traction Company the bus company applied for a permit. At the hearing on Sept. 14 the traction company filed the only protest against the bus company. The bus company was prepared to file a brief in answer to the protest of the railway, but before the time for filing the brief had expired the State Road Commission rejected the petition and notified the bus company to that effect.

The Ultimate Bus Company started operation last spring and soon keen competition with the Wheeling Traction Company followed. No action was taken, however, until the new state road law, passed at the last session of the legislature became effective. The law prohibited the operation of buses until permits had been secured from the state road commission where the traffic is interstate. As a result of a subsequent hearing in Wheeling at which a representative of the state road commission was present no action was taken but all bus companies accepted immediately filed applications for permits.

In the meantime the Wheeling Traction Company sought an injunction in the circuit court to restrain the bus company from operating, but on the petition of the bus company the case was removed to the federal court where Federal Judge W. E. Baaker refused to grant the injunction. According to a statement made by the counsel for the Ultimate Bus Company the line will not suspend.

Fare Increase Postponed

The threatened raise of fares by the Community Traction Company, Toledo, Ohio, did not go into effect on Oct. 1. President Frank R. Coates rescinded the order upon the advice and statistical data furnished by Street Railway Commissioner Wilfred E. Cann.

The month of October will be a test month for the rival figures of the commissioner and statisticians for the company.

It is the commissioner's belief that riding will show a tendency to increase and that through economies and a decrease in expenditures for maintenance in winter months he will be able to show an increase in the stabilizing fund at the end of the month. The first year under the new grant expires on Feb. 1.

It had been proposed to increase ticket fares on Oct. 1 from the rate of six for 40 cents, or 6⅔ cents each, as against 6¼ cents each, but to continue the cash fare of 7 cents with 1 cent additional for each transfer.

Wants to Abolish Ticket Sales

Alleging that the Public Utility Commission of New Jersey erred in its estimate of the revenue returned when it handed down its decision in the New Jersey & Pennsylvania Traction Company's 10-cent fare case, early in July, the company on Sept. 20 appeared before the board asking permission to abolish the sale of tickets.

The board allowed an increase in the fare on the Princeton line from 7 to 8 cents in each zone or 7½ cents if tickets were purchased. The company now seeks to do away with the tickets, which are sold four for 30 cents. The board claimed that the new rate of fare would yield an annual revenue of approximately $124,960, or a net income of $29,500. The company claims these figures were made on a straight 8-cent fare.

Additional testimony was taken and decision reserved.

Auto Service Cuts Into Interurban Business

Jitney competition is credited by many with putting the Saginaw-Bay City Railway out of business, and since the Glaspie rate law went into effect about thirty touring cars have commenced operations between Saginaw and Flint, and Saginaw and Bay City. The heaviest travel is between the first-named cities. The fare charged by the Michigan Railway is $1.07. The touring cars carry passengers for $1 and the operators are actually soliciting patronage from the interurban waiting room when there is no policeman around.

Company officials are incensed at the high-handed manner in which this competition is being forced on them and assert that it is unfair. Most of the road between Flint and Saginaw is a concrete pavement for which the taxpayers paid $30,000 a mile. The railroad pays taxes and maintains its own right-of-way and the city governments allow those who happen to own touring cars to injure the company's business. Just what steps will be taken to combat the jitneys is unknown, but the police have been asked to stop the men from going into the waiting room and asking people to ride with them. There is not an officer present every time an interurban arrives or departs from the station, but steam roads are accorded protection, company officials point out, and say that more passengers arrive and depart from their waiting room than from any steam road passenger station in Saginaw.

During fair week the operators' committee representing the jitney men appealed to Mayor B. N. Mercer to stop touring cars from operating on the streets and depriving them of business. They asserted that the touring cars were without licenses. Previous to the complaint the Mayor appealed to every owner of a touring car, if on the way to the fair and room was available, to pick up passengers. Many took this to mean to operate without a license and charge for carrying passengers. The jitney owners received an absolute refusal to comply with their request, the Mayor asserting they started a competitive service when the street cars were running and he did not propose to stand in the way of others doing to the jitney bus owners what they had done to the railway.

With City's Help Five-Cent Fare Is Possible

The Indianapolis (Ind.) Street Railway will be able to maintain a basic 5-cent fare if the city eliminates the burden of paying the special franchise tax of $500,000 and relieves the company also of the cost of paving between tracks, Dr. Henry Jameson, chairman of the board of directors of the company, said following a recent meeting of the executive committee of the directors. The meeting was devoted largely to discussion of two ordinances introduced in the City Council which proposed a solution of the controversy between the city and company.

Directors of the company seemed satisfied that passage of the ordinance, which would prohibit jitneys receiving or discharging passengers on streets on which cars operate and which would require jitney drivers to file high bonds and conform to other stringent regulations, will stop loss of revenues, which company officers declare amount to $1,200 daily.

Dr. Jameson declared that railway officials will have no objection to passage of the other ordinance, which provides for continuing all provisions of the surrendered franchise not inconsistent with State laws and the power of the Public Service Commission, if it is practical and economical. While declining to comment outright on whether the company will contest payment of the franchise tax and paving costs in case the ordinance is passed, he declared that it will be better for the public if the company is relieved of these two burdens and asserted that eliminating these features would mean maintenance of the basic 5-cent fare.

Bus Plans Described

The City Commission of Manistee, Mich., recently heard the plan of operating a motor bus line in the city by a representative of the Duplex Sales Agency of Lansing, one of the bidders for the right to operate.

He described the type of bus which would satisfy the needs of Manistee and stressed the necessity for investigating thoroughly the transportation problem in the city before installing buses. In his talk he emphasized the importance of local capital in the enterprise.

Railway service in Manistee was abandoned on Sept. 1. Reference to this suspension was made in the ELECTRIC RAILWAY JOURNAL, issue of Sept. 10, page 416

Transportation News Notes

One-Man Cars in Use.—The Binghamton (N. Y.) Railway is now operating one-man cars over its system with the exception of the Endicott and Union Street lines.

Extra Pay for Safety Runs.—The Muskogee (Okla.) Electric Traction Company has offered to motormen a cash bonus of $5 a month for each month they operate their cars without an accident.

Buses Prove Satisfactory.—The auxiliary bus service started on Humberside and Annette Avenues in West Toronto, Ont., has proved exceedingly popular with the citizens and is giving a five-minute service which is well patronized.

Arranging for Live Stock Shipment.—Plans for shipping live stock over the Interstate Public Service Company's lines between Indianapolis and Louisville, Ky., are being made and it is expected stock trains will be in operation on the lines by the new year.

May Use Trackless Trolleys.—The Transportation Commission has notified the Toronto Board of Control that it is prepared to operate motor bus or trackless trolley service in Toronto on Mount Pleasant Road as far north as Eglinton Avenue as a temporary means of relieving the traffic situation on North Yonge Street.

Will Consider Bus Line.—A hearing on the proposed bus franchise for Little Rock, Ark., was held recently by the public utilities and ordinance committees of the City Council. The Citizens' Bus Company is asking for the franchise for ten years. The chief reason for the service is to afford residents of the districts not served by railway lines an opportunity of reaching the downtown districts. The matter was deferred for further consideration.

Attractive Issue Out.—The story of electrical development in Chattanooga, Tenn., is told in an interesting article in the September number of *Electro Topics* entitled "Chattanooga — An Electrical Center," in which the author concludes by saying that there is no reason why Chattanooga should not become the electrical center of the South. Another interesting article in this number is "The Nature and Handling of Complaints." The expensive operation of automobiles is the subject of another instructive account. *Electro Topics* in this issue also tells what the railway property has done during the last few years in the way of reconstruction and improvement work. This little magazine, published by employees of the Chattanooga Railway & Light Company, should appear often instead of "every little while."

Personal Mention

New Duties for Mr. Fountain

H. A. Fountain was recently appointed secretary of the executive committee of both the Toledo Railways & Light Company and the Community Traction Company. But a few years ago Mr. Fountain was a motorman on the cars in Toledo.

Mr. Fountain started work for the Doherty Company in Joplin, Mo., as a draftsman during his college vacation. After graduation from the University of Missouri, he was a junior engineer from July, 1913, until July of the next year with the Denver Gas & Electric Company, also a Doherty property.

One year later he came to Toledo as a junior engineer, one of the first ten on that property. It was to have been his duty to make a survey of the traction problems, but the work was abandoned at the outbreak of the war and instead he went on the cars as an extra trainman. Today he admits that the experience he received in those days as a motorman is probably the most valuable he ever had.

From March, 1915, until July of this year he was in the New York office, at first compiling statistics of the Cities Service Company's earnings. Then he went into the operating department handling construction requisitions, later developing the construction and stock budget system, being in complete charge of this work. He also acted as secretary of the finance committee.

At Mr. Doherty's personal request he organized the bureau for the rating of investment securities and developed a procedure for the investigation and formulation of reports on industries, companies and securities, and directed the work of this bureau. On July 15 of this year he came to Toledo as director of the important budget system and also as secretary of the executive committee of both the Community Traction Company and the Toledo Railways & Light Company.

The public utility properties at Toledo under the management of the Doherty interests have recently been segregated so that the railway and the lighting systems are now entirely separate. This change was carried out under terms with the city calling for operation under service at cost.

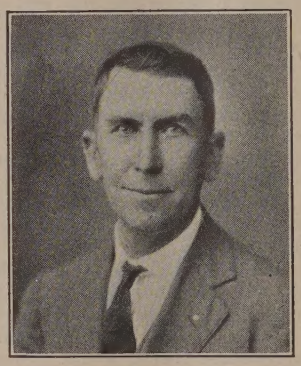
Mr. Duffy Appointed to Detroit United Railway

C. Nesbitt Duffy, recently assistant to vice-president—accounting and finance—of the Philadelphia Rapid Transit Company, has been elected comptroller of the Detroit United Railway. Before his appointment to the Philadelphia Rapid Transit Company Mr. Duffy was for a long time in the Philippines first as vice-president and general manager of the Manila Electric Railway & Light Company and later as vice-president of the Visayan Refining Company. Previous to that he was connected for many years with the Milwaukee Electric Railway & Light Company.

Mr. Harvell Advanced

Light and Power Superintendent Named as Mr. Buchanan's Successor in Richmond

On almost the thirty-fourth anniversary of his career as a public utility man, John E. Harvell assumed his new duties on Oct. 1 as general manager of the Richmond-Petersburg division of the Virginia Railway & power Company, Richmond, Va., succeeding C. B. Buchanan, whose resignation was announced last week. In addition to his duties as general manager, Mr. Harvell will continue to have full charge of the company's light and power business throughout the entire system.



JOHN E. HARVELL

Mr. Harvell is a native of Petersburg and has acquired wide practical knowledge and experience both in the construction and operation of public utilities. He secured his first job on Sept. 13, 1887, as a lineman with the Upper Appomattox Company, one of the pioneer companies in harnessing water power for public service. In 1891 he was made assistant superintendent and three years later was promoted to superintendent of operations. When the interurban line between Richmond and Petersburg was put into operation in 1898 Mr. Harvell was placed in charge of the service but was relieved five years later in order to give his full time to the present hydraulic power development which was then being made on the Appomattox River.

When the Virginia Railway & Power Company was organized in 1909, Mr. Harvell continued in charge of the operations of the interurban and Petersburg city lines and was later, in addition, given supervision of the company's light and power properties at Weldon and Roanoke Rapids, N. C. In 1918 he was appointed general superintendent of light and power divisions of the entire system, including Richmond, Norfolk, Portsmouth and Suffolk, which duties he will continue to discharge in his new appointment.

During the war period when government activities and the increased populations of Richmond, Hopewell and Norfolk and vicinity were clamoring for more electric power Mr. Harvell was assigned to the mammoth undertaking decided upon by the company's directors of constructing the present high-power transmission line between Richmond and Norfolk, the then only possible means for providing the additional electric power requirements. The task was completed in remarkably short order and under most trying conditions. Recent construction work completed under Mr. Harvell's supervision includes a new substation at Hopewell and a transmission line between Petersburg and Hopewell for providing adequate power facilities for the new Hopewell which is arising out of the ruins of the old, and he is now engaged on the new project recently undertaken by the company of restoring an abandoned power plant and dam on the Appomattox River at Petersburg.

Mr. Harvell's experience extending over thirty-four years in construction work and also in the operation of railway, light and power service fits him admirably for the new post assigned to him in the company's organization.

Alva R. Dittrick, the only Cleveland city councilman to serve continuously on that body from 1910 when the Taylor service-at-cost grant went into effect, retired from that body to become a county commissioner this month. For six years Mr. Dittrick has been a member of the council street railway committee before which all legislature effecting the Cleveland (Ohio) Railway must pass. For the past two years he has been chairman of that body and as such will be succeeded by councilman Sam B. Michell.

Judge Julius M. Mayer of the United States District Court, whose nomination to the Circuit Court of Appeals was sent on Sept. 22 to the Senate by President Harding, will continue jurisdiction over the receiverships of the Brooklyn (N. Y.) Rapid Transit and the New York Railways Company. Judge Mayer was appointed to his present position by President Taft in February, 1912. Since that time he has handled many important cases, especially those involving traction. Apart from directing the affairs of the receiverships of the Brooklyn Rapid Transit and the New York Railways Company he has had the suits in equity against the Interborough Rapid Transit Company begun by the American Brake Shoe & Foundry Company placed before him. The suits have been before him on three different occasions on orders to show cause why a receiver should not be ap-

pointed, and each time he has granted an adjournment on the ground that a receivership should be avoided if possible.

Obituary

Thomas A. Wright

Thomas A. Wright, vice-president and general manager of the Wilkes-Barre (Pa.) Traction Company, died on Sept. 28, as the result of injuries received in an automobile accident. Mr. Wright was connected with the Traction System of Wyoming Valley for nearly thirty years. He was one of the organizers of the Wilkes-Barre Railway and since its organization in 1910 has been its chief executive officer.

All railway men will recall the controversy between Mr. Wright and the employees of the company that resulted in the strike called in the fall of 1915 and lasting for fourteen months. It was a case in which the events of the first few days turned from any attempt to settle the main issue to disorder and riot. The issue lay in the refusal of the trainmen to abide by an arbitrated decision. The controversy became so fierce at one time that it resulted in strike sympathizers making a personal attack on Mr. Wright. This spurred him on to an even greater determination to carry the fight to a successful finish for the company, and such was the outcome when the strikers accepted the decision handed down by the arbitrators in December, 1916.

Mr. Wright was born in Quakertown, Penn., Nov. 30, 1863. He was educated in the Quakertown public schools and subsequently pursued a course in the Wyoming Seminary, after which he turned his attention to civil engineering. Subsequently for several years he practiced engineering in Wilkes-Barre.

A few years later Mr. Wright began railroad work and assisted in the survey of the Harvey's Lake Branch Railway. In 1892 he entered upon the survey of the present trolley system of the Wyoming Valley and has been with the Wilkes-Barre Railway Company since. In 1897 he was made general manager of the maintenance of way department and two years later was appointed general superintendent of the entire system consisting of nearly 100 miles of track, all of which was surveyed, constructed and brought to its present high standard of excellence under his immediate direction.

He was named general manager of the Wilkes-Barre Railway Company in 1910 when local interests purchased the lease of the old Wyoming Valley Traction Company. Mr. Wright served for one term as president of the Pennsylvania Street Railway Association.

His son, T. A. Wright, Jr., has been identified for some time with the Wilkes-Barre Railway as auditor.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Stronger Copper Demand

Copper prices went up the early part of this week, and little if any October metal can be bought less than 12⅝ cents delivered. Rise in price is due to increased demand here and abroad. There is a feeling in the trade that the corner has been turned in copper, and that prices will be upward for some time to come.

Several important consumers are figuring upon orders covering business running late into 1922. This is the most encouraging aspect of the situation. Apparently the consumers have decided that it is useless to try to get one producer to fight another any longer by cutting prices drastically to get business. All have seemed to learn that when such tactics are followed the producers all suffer greatly while consumers in their turn lose through the price uncertainty which results.

Brass and wire orders are increasing with the demand unusually good for tubes and sheet copper and brass. Apparently copper prices, barring most untoward developments in Europe, are destined to rise slightly higher. However, it can be expected that the next rise of ½-cent a pound in price will take much longer to effect than the last. Most large producers are at present out of the market.

Price of electrolytic copper is 12⅝ cents a pound delivered for September domestic shipments, and 12⅝ for October and November combined. Price of Lake copper is 12⅝ to 12¾ cents a pound delivered for October and November.

Demand is strong from both wire and brass people with business for makers of sheets and tubes unusually good. Orders being placed by ultimate consumers with manufacturers are said to be widely scattered and inclined to moderate rather than large size in most instances.

Rectifiers for a French Railway

The increasing employment, says the London *Electrician*, of the mercury rectifier for railway work abroad is exemplified in a contract recently placed with the Sociétié Anonyme Brown, Boveri et Cie by the Chemins de Fer du Midi. This contract is for the complete equipment of five substations at Pau, Lourdes, Tarbes, Montrejeau and Lannemezan respectively with mercury are rectifiers.

The contract comprises in all sixteen 1,200-kw rectifier sets to operate on the direct-current side at the high pressure of 1,575 volts. Each set consists of a single main transformer supplying two high tension rectifiers in parallel. The primary supply will be three-phase at 60,000 volts, and a frequency of 50. Everything from the high tension to the direct-current side is included in the contract. The overload capacity for which the rectifiers are being designed is 50 per cent for two hours and 200 per cent for five minutes.

Messrs. Power Rectifiers, Ltd., who represent this end of Brown, Boveri's activities in England, say that the progress made during recent years with this class of plant is very marked, something like 160 individual equipments being either installed or in hand. They comprise roughly 340 separate rectifiers giving a total capacity of about 100,000 kw.

Railway Electrification in Madagascar

The governor general of Madagascar has decided to electrify the railroads of that colony from Tananarive to Tamatave, according to *Commerce Reports*. A hydro-electric power station will be built on the Vohitra river to furnish a maximum power of 30,000 hp. The length of the line is 93 miles and the total cost of the installations will reach $4,620,000. Assistant Trade Commissioner F. G. Singer, who furnished this information, states that the governor general is also considering the electrification of the future railroad from Diego-Suares to Joffre Ville, a road about 22 miles in length.

Waterpower Development in Japan Is Being Pushed Rapidly

Japan is pushing work on hydro-electric development as the demand for power in the larger cities as well as the smaller villages is far in excess of the supply available, according to Stephen Q. Hayes, a special electrical engineer of the Westinghouse Electric & Manufacturing Company, who recently returned from a six months' tour of Australia and Japan, where he made a special study of business conditions. Tokyo and Yokohama, near the eastern end of the main island, are supplied with power at 50 cycles from many hydro-electric plants and there is an electrified section of the railway between these two cities with multiple-unit trains every ten or fifteen minutes.

Near the middle of the main island, about 350 miles from Yokohama and Tokyo, are the large manufacturing cities of Kyoto, Osaka and Kobe. These are fed by numerous transmission systems operating at 60 cycles. Some of the most important hydro-electric generating stations are located about half way between the two groups of cities and some interesting problems

are involved in making some of these stations suitable for feeding 50-cycle current to Tokyo and Yokohama and 60-cycle current to Kyoto, Osaka and Kobe.

Nine Electric Locomotives Exported During July

Of the nine electric locomotives exported from this country during July, eight, having a total value of $412,076, went to Brazil, says *Commerce Reports*, and one, invoiced at $11,100, went to England.

Bituminous Coal Output Falls

Production of bituminous coal in the United States during the week ended Sept. 3 was 7,571,000 tons, against 7,763,000 tons in the week previous, and 11,167,000 in the week ended Sept. 3, last year, according to the Geological Survey. For the calendar year to Sept. 3 the output was 264,647,000 tons, against 354,396,000 tons in the same time, last year.

Express Locomotives for Chile

Six express locomotives were also included in the order of the Chilean State Railroad from the Westinghouse Electric International Company. The other locomotive equipment to be furnished, as was announced last week, includes eleven local passenger and fifteen road freight locomotives and seven switching engines. All of these locomotives are of Baldwin-Westinghouse manufacture.

Will Study American Developments

It has been learned through government channels that R. Shirase, a Japanese government official and traffic manager of the railway department of the Formosan Government General, arrived in San Francisco on board the steamship *Taiyo Maru*, Sept. 9, 1921. His visit to the United States is for the purpose of studying the developments of the railroad situation in this country following the war. While Mr. Shirase is not a purchasing agent, it is understood that a considerable volume of railway material will be purchased later on, based upon his reports and recommendations. Mr. Shirase may be addressed in care of Mitsu & Company, 65 Broadway, New York.

Rolling Stock

Elmira Water, Light & Railroad Company, Elmira, N. Y., is intending within the next four weeks to place an order for three safety cars.

Los Angeles (Cal.) Railway will install 350 new motors on center-entrance cars. These are the largest cars operated by the railway. Westinghouse and General Electric equipment is being used. The total outlay will be about $350,000. The cars to be equipped are of the two-motor type.

New York, New Haven & Hartford Railroad has purchased from the International Motor Company three gasoline motor cars adapted for operation on rails by special trucks. They will have seating capacity of 35 and also a compartment for baggage. Delivery of these cars is expected early in December. They will be used in short-haul passenger service on branch lines.

Pacific Electric Railway, Los Angeles, Cal., has just placed in commission eleven rebuilt two-man side entrance, pay-as-you-enter, stepless cars. These cars will be operated on the Willowville-American Avenue line and the East Third street line. The cars represent modern design in local street car transportation and are considered almost accident proof. Work is being rushed on the new steel interurban cars assigned to the Long Beach route, which, as soon as completed, will be placed in service.

J. G. White Company, New York, has purchased for immediate delivery on account of the Manila Electric Company two "trollibuses" from the Atlas Truck Corporation, York, Pa. These machines are to be built according to the same design as those already built for operation in Richmond, Va., and on Staten Island, N. Y., with the exception that it is propelled by a single 45-hp. motor instead of a single 25-hp. railway motor in the case of those now operating in Richmond and two 25-hp. motors coupled in tandem as used on the Staten Island rail-less vehicles.

Track and Roadway

Ironwood & Bessemer Railway & Light Company, Ironwood, Mich., has extended its lines from Ayer Street south and east to Bonnie Street.

St. Thomas, Ont.—The electrification of the Canadian division of the Pere Marquette Railway is reported to be again under consideration.

Savannah (Ga.) Electric Company will extend its double tracks on Habersham Street from Anderson to Thirty-Seventh. Permission was recently granted by the city and work will start directly.

Public Service Railway, Newark, N. J., has notified the board of commissioners of Haddonfield, N. J., that it will furnish better trolley service, repair roadbeds and lay new tracks within the borough limits.

Toledo, Fostoria & Findlay Railway, Fostoria, Ohio, will lay new 60 lb. rails from the Baltimore & Ohio to the Lake Erie crossing. The rails will be slightly elevated in order that street re-surfacing will not be impeded in the future.

Toronto, Ont.—Mayor Church is urging the Transportation Commission to proceed with the construction of a double-track extension of the King Street car line from Sunnyside to the Humber. The Commission has decided not to construct the extension until next spring.

Northern Texas Traction Company, Fort Worth, Tex., has been granted authority by the City Commission in Fort Worth, Tex., to extend its University line three blocks from Elizabeth Boulevard to Cantey Street on South Adams Street. Work on the extension will begin at once.

Duluth (Minn.) Street Railway, has drawn up plans for a double-track extending 125 ft. from Tower Avenue along Twenty-first Street in the direction of Ogden Avenue. From this point the line will run on a single track for eleven blocks to Grand Avenue. The single-track plan has been approved by the City Council.

Frankford Elevated Railway, Philadelphia, Pa., may be extended 300 ft. north of Arch Street along Front Street to Market Street. Provision is also made for a temporary terminal as near Market Street as possible. The plans for the extension are nearly completed and bids will probably be asked for within the next three weeks.

Toronto (Can.) Transportation Commission, in connection with its reconstruction work will erect on the site of the Hillcrest site, carhouse and repair plant to serve the whole railway system. Property has also been acquired at Yonge & Eglinton Avenue for carhouses in North Toronto, and on the northwest corner of Eglington and Duplex Avenues a new substation similar to the one south of St. Clair Avenue is to be built.

Frankford, Tacony & Holmesburg Street Railway, Philadelphia, Pa., has placed within the last month with the Lorain Steel Company orders for six new spiral curves, section 114 No. 480 and 80 tons of 7-in. Trilby rail section 105 No. 484. In the spring of this year the company placed orders for 300 tons of rail section 105 No. 484 and about $14,000 worth of railroad crossings, new sidings and other special work with the Lorain Steel Company. Also 6,000 ties were ordered from Bernard Brothers. The railway does not expect to purchase further this year.

Trade Notes

Ohmer Fare Register Company, Dayton, Ohio, recently received a contract with the Georgia Railway & Electric Company, Atlanta, Ga., for equipping all of its cars with No. 3 type Ohmer registers.

E. E. Aldous has been appointed representative of the American Steel & Wire Company in St. Paul-Minneapolis-Duluth territory, with headquarters at St. Paul. Mr. Aldous has been connected with the company for twenty years in different positions.

Indianapolis Switch & Frog Company, Springfield, Ohio, announces a new line of rubber-covered flexible cables and cords for use with portable electrical equipment. A special cable has been designed for use with electric welders, grinders and all track tools. The outside coating, rubber-vulcanized under compression, resists abrasion, does not absorb water or liquid, is non-kinkable and of high tensile strength and extremely flexible.

Hunter Grubb has been made general manager in charge of paints of the du Pont Company, Wilmington, Del., following the company's resumption of its old plan of supervising its industries. Under the plan there will be a general manager in charge of each industry, while during the war supervision of the various industries of which the company is the owner was delegated to different members of the executive committee.

Carl F. Dietz, vice-president and sales manager of the Norton Company, Worcester, Mass., has resigned to become president and general manager of the Bridgeport (Conn.) Brass Company. He succeeds as president Fred J. Kingsbury of New Haven, who becomes chairman of the board of directors. Mr. Dietz has been connected with the Norton company for ten years, first as plant engineer, then as assistant sales manager, and afterward as sales manager of the wheel division of the business. Two years ago, when the Morton Company and the Norton Grinding Company were consolidated, he was made vice-president and sales manager.

New Advertising Literature

Insulators.—The Porcelain Insulator Corporation, Lima, N. Y., has issued a booklet, the purpose of which is to describe its pin-type insulators, manufactured for use on transmission lines operated at voltages from 6,600 to 70,000.

Battery Equipment.—S. R. Orum, 503-505 North Eleventh Street, Philadelphia, manufacturer of battery shop equipment, has issued a new catalog covering his products.

Safety Switches and Panel-Boards.—Catalog 12-A issued by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., includes new types of safety motor starters and safety panel-boards.

Track Reclamation.—Indianapolis Switch & Frog Company, Springfield, Ohio, has recently issued a booklet on the subject of track construction and reclamation by the arc welding process.

Electric Drill. — The Elecyto-Magnetic Tool Company, Chicago, has developed and placed on the market a ¼-in. drill which may be used as a drill press by attaching to a portable stand.

Heavy-Duty Grinder. — The Van Dorn Electric Tool Company, Cleveland, has recently put on the market an improved heavy-duty ball-bearing electric grinder driven by a 4-hp. motor.

Edison Lamp Works, Harrison, N. J., part of the General Electric Company's system, has issued a series of pamphlets entitled "Lighting Data." Each booklet describes some phase of the lighting subject, one being on the proper system for lighting railway buildings and yards, another on lighting for outdoor sports, a third for lighting of printing plants, another a discussion of reflectors for incandescent lamps, etc.

Manganese Track Society and the Manganese Steel Founders' Society, Chicago, have issued in pamphlet form the specifications for switches, frogs, crossings and guard rails, as adopted for recommended practice by the American Railway Engineering Association at its annual convention in March, 1921. The pamphlet makes up a book of ten printed pages, printed on one side of the sheet only.